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SUPPLEMENT NUMBER 18 ON WAR MEDICINE AND SURGERY:
Injuries of Peripheral Nerves.

PNEUMOCOCCAL MENINGITIS OF OTITIC ORIGIN: RECOVERY FOLLOWING CHEMOTHERAPY AND OPERATION.

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PNEUMOCOCCAL MENINGITIS, before the advent of the sulphonamide series of drugs, was almost invariably fatal; Gilmore and Sacks[1] found only 58 cures recorded in the English literature. Sulphapyridine has greatly improved the prognosis, and recently many authors have dealt with its use in the treatment of pneumococcal meningitis of otogenous and non-otogenous origin. Hodes, Gimbel and Burnett[2] in 1939 recorded eight recoveries in seventeen cases, whilst Lewy[3] in 1940 reported seven cures; three of these cases had followed ear infections. Lowe[4] in the same year discussed recovery from a primary type XX pneumococcal meningitis which had followed a cold. In 1942, Hollander[5] found 58·5% of recoveries among 82 patients treated with sulphapyridine, and only 35·9% recoveries among 78 patients treated with sulphanilamide.

Sulphathiazole administration has also been successful; Spink and Hansen[6] had one recovery in three cases, whilst Morrison and Gough[7] reported the cure of a patient, aged thirty-six years, after the administration of 150 grammes of sulphathiazole and specific type III antipneumococcus serum. In the last-mentioned case, the sulphathiazole level in the patient's cerebro-spinal fluid was 0·5 milligramme to 1·0 milligramme per 100 cubic centimetres, and it never exceeded 10% to 20% of the blood level. Hollander[5] considers that its low concentration in the cerebro-spinal fluid renders this drug less suitable than sulphapyridine in the treatment of any form of meningitis.

Recently Burman, Rosenbluth and Burman[8] reported two recoveries after treatment with sulphadiazine, specific antiserum and mastoidectomy, and stressed the fact that a blood concentration of the drug of 15 milligrammes per 100 cubic centimetres was ideal for maintaining an optimum cerebro-spinal fluid level of 10 milligrammes per 100 cubic centimetres. More results are necessary before the value of sulphathiazole and sulphadiazine can be assessed.

The principal object in chemotherapy is to obtain rapidly and then to maintain an adequate concentration of the drug in the cerebro-spinal fluid until the infection is controlled; the dose is then gradually reduced. This is difficult at times, because of the variable absorption of the drug from the gastro-intestinal tract, especially in the presence of nausea and vomiting. Consequently, whilst a level of 10 to 20 milligrammes of sulphapyridine per 100 cubic centimetres of cerebro-spinal fluid is desirable, recoveries have followed levels of 1·7 to 30·3 milligrammes and 1·1 to 29 milligrammes per 100 cubic centimetres of blood and cerebro-spinal fluid respectively. In the majority of the cases in which recovery occurred the cerebro-spinal fluid became sterile within four days; but when the meningitis relapsed and pneumococci were again recovered, it often took seven days or more to sterilize the cerebro-spinal fluid. Ross[9] reported a fatal case of pneumococcal meningitis, in which the organism was at first sensitive to sulphapyridine and later insensitive, as shown by cultural examination of material taken before and after death. In contrast to the foregoing finding, Craddock and Bowers[10] recorded the history of a Negress admitted to hospital four times in twelve months with suppurative meningitis; pneumococci types XVII and XXVIII were isolated on two occasions, whilst no pneumococci were found during the two other illnesses. There was a prompt recovery on each occasion when sulphapyridine was given. However, the usual experience has been that, unless the treatment is properly handled, exacerbations and relapses show a less dramatic response even to larger doses of sulphapyridine. Hollander[5] has suggested that this may be due to a persistence of suppuration in the cisternæ, suppuration becoming diffuse when the concentration of the drug is lowered. Consequently, a high level of sulphapyridine should be maintained by full dosage for at least five to seven days after the patient feels perfectly well and is afebrile, and after successive cultural examinations of his cerebro-spinal fluid have given negative results; then

the dosage should be halved for several days and the treatment gradually discontinued. In a series of cases in which recovery occurred, the dosage of sulphapyridine has varied from 12 to 176 grammes, whilst in fatal cases it has been as much as 90 grammes without effect. During the administration of these drugs, attention should be paid to the white cell count, the blood film, hæmoglobin percentage and the urine. Adequate fluid intake and alkalinization of the urine lessen risks of hæmaturia and uræmia from deposits of acetylsulphapyridine crystals in the urinary tract.

Chemotherapy alone has been most successful in those cases in which complications have followed rapid extension along vascular channels before gross bony destruction has occurred, and in which examination of the bone discloses either pneumatization of limited small-cell type or partial sclerosis. In these cases, there is less chance of a focus of necrosis or abscess in the bone. However, limited pneumatization does not rule out the possibility of cortical erosion, or of extradural or subdural abscess. Even a cell breakdown cannot always be excluded or diagnosed by X-ray examination. Chemotherapy appears to relieve the urgency of surgical intervention; but when clinical evidence indicates suppuration in the mastoid or pyramid, surgical removal of the affected cells along with chemotherapy is much more effective than drug therapy alone. Some authorities, however, encouraged by dramatic recoveries from diffuse meningitis of otogenic origin, advocate control of the meningitis before drainage of the primary focus, even demanding clinical evidence of mastoiditis and radiological proof of bone necrosis. Sulphapyridine therapy may mask mastoiditis and bone infection; even the maintenance of a high level of 14 milligrammes or over per 100 cubic centimetres of blood for several days to two weeks has failed to sterilize a focus of bone infection, probably because the large air cells permit the accumulation of considerable amounts of infected exudate. As a result, symptoms may recur before but usually after the withdrawal of the drug. At times, the presence of local bone disease in meningitis is difficult to recognize. Timely surgical drainage offers the only chance of preventing meningitis secondary to suppurative labyrinthitis and petrositis, and it should be carried out if there is the slightest suspicion of meningeal irritation.

Apart from chemotherapy and surgical treatment, other measures are helpful in the control of pneumococcal meningitis. It has been suggested that, after a large dose of sulphapyridine which has a bacteriostatic effect, specific antibacterial serum should be given to neutralize toxins and destroy organisms. Argument still exists as to the efficacy of serum. Hollander[10] found a 58% recovery rate from treatment with chemotherapy alone or when combined with antiserum. In infections with pneumococci types I, V and VII, in which serum appears to be most efficacious, there was little difference in mortality rate, except that in type V infections combined therapy gave an 83% recovery rate. Hollander suggested that chemotherapy and serum therapy together might improve the prognosis in the lower age groups and also in meningitis secondary to an oto-rhinological condition.

Blood transfusion, repeated if necessary, may be helpful in overcoming the toxæmia. Ample fluids, given intravenously if needed, and sufficient sodium chloride should be administered as supportive therapy. When dehydration is present, salt aids the retention of fluid in the tissues and perhaps maintains a higher level of sodium chloride in the cerebro-spinal fluid. Lumbar puncture is needed for diagnostic purposes and also occasionally to relieve pressure symptoms; forced spinal drainage is no longer necessary.

Report of a Case.

The following case record illustrates many of the points raised in the treatment of pneumococcal meningitis following a middle ear infection and labyrinthitis.

W. P. McB. complained of a left earache, which had commenced on December 26, 1941; it gradually increased in intensity and spread as sharp pain to the left temporal region and to the left shoulder. On December 28 he felt nauseated and vomited; his medical adviser ordered him to hospital and performed a left myringotomy. On the following day a "splitting" headache, urinary retention necessitating catheterization, and neck stiffness developed; all these symptoms, together with drowsiness and irritability, persisted until I first examined him on December 31.

Routine examination revealed a well-nourished man who was drowsy and resented interference; he had left acute suppurative *otitis media* with a bulging drum and slight hæmorrhagic discharge, and signs of meningitis. Under general anæsthesia the left ear drum was incised and thick pus escaped, whilst a lumbar puncture revealed turbid cerebro-spinal fluid under greatly increased pressure. With Gram's stain the fluid was found to contain many pus cells and a few large round cells, but no organisms; on culture a pure growth of pneumococci was obtained.

Four tablets (2·0 grammes) of sulphapyridine were given orally as soon as the patient became conscious, and the dose was repeated every two hours for three doses, followed by two tablets every six hours. Improvement was noted on the following day; drowsiness was less pronounced, but meningeal irritation was still present. An X-ray examination of the mastoid area on January 5, 1942, revealed no bony lesion. Progressive improvement took place, and the patient was allowed out of bed on January 13 and discharged from hospital eight days later, feeling very well apart from some left temporal headache. The total dosage of sulphapyridine given over nine days was 41·5 grammes.

He was given instructions to report again on February 9, because persistent slight left otorrhœa and absolute deafness in the left ear suggested that the meninges had been infected via the labyrinth, the latter being left "dead". At no stage had there been a history of vertigo or severe vomiting, whilst nystagmus had not been noted.

Since it was evident that the *otitis media* would not heal spontaneously, arrangements were made for a mastoidectomy later in that week. The patient, however, postponed the operation on his own initiative, because of the development of a severe cold necessitating rest in bed. On February 19 he was readmitted into hospital with a recurrence of pneumococcal meningitis; this was confirmed by examination of the cerebro-spinal fluid. Large doses of sulphapyridine were immediately administered, with slight improvement during the first twenty-four hours. On February 20 a radical mastoidectomy and drainage of the labyrinth by Neumann's method with an extension to the internal auditory meatus were performed. The mastoid cells and middle ear contained granulation tissue, and a large slit-like fistula into the lateral semicircular canal was easily detected. A wire was passed via the vestibule through the fistula from inside outwards. The wound was left widely open and the cavity was lightly packed with "B.I.P.P." gauze. Facial paralysis was observed on the patient's recovery from anæsthesia. In the next few days the packing was changed daily, and the vestibule was probed with a wire to facilitate drainage of the cerebro-spinal fluid. One week later, a meatal plastic flap was cut and the wound was closed by secondary suture. Convalescence was uninterrupted.

On February 21, the day after operation, the patient felt very well, was bright mentally and could pass his urine naturally. On February 25 there were no signs of meningitis, and on the following day, the cerebro-spinal fluid was under normal pressure and slightly yellow in colour, and contained 33 lymphocytes, two monocytes and one red blood cell per cubic millimetre; its protein content was 65 milligrammes per 100 cubic centimetres, and cultural examination produced no growth of organisms. On February 28 the patient did not feel well, and on March 4 meningeal symptoms recurred. A lumbar puncture again revealed opalescent fluid under increased pressure; it contained 1,250 cells per cubic millimetre, the great majority being lymphocytes with only occasional pus cells. On culture a pure growth of an oval Gram-positive coccus was isolated, which after several subcultures took on the characteristics of the pneumococcus. A blood examination gave the following information: the hæmoglobin value was 80%, the erythrocytes numbered 4,240,000 per cubic millimetre and the leucocytes 11,550 per cubic millimetre, 91% belonging to the myeloid series. Twelve grammes of sulphapyridine were given on this date, followed by six grammes on the following two days; difficulty in its administration was present because of constant nausea. Some improvement in the patient's condition followed during the next four days, although neck stiffness and a constant left temporal headache, especially in the region of the zygomatic process, remained.

Lumbar puncture was again performed on March 11; the cerebro-spinal fluid was similar to the previous specimen, except that it contained 490 cells per cubic millimetre with

more pus cells. The hæmoglobin value was 76% and the white cells numbered 8,650 per cubic millimetre of blood. The left ear had completely healed and there were no neurological or ophthalmological changes.

The patient's condition now seemed hopeless; it was then decided to give him intravenously six grammes of sodium sulphapyridine in 200 cubic centimetres of saline solution and to follow this up with sulphathiazole, four tablets every six hours, because of his nausea.

On March 17 the patient showed marked pallor, increased neck rigidity, extreme weakness, a sulphathiazole rash on his neck and arms and severe conjunctivitis. A blood examination gave the following information: the hæmoglobin value was 58%, the red cells numbered 3,250,000 per cubic millimetre and the white cells numbered 15,500 per cubic millimetre, a polynuclear leucocytosis being present.

On March 18 a transfusion of one pint of citrated blood was given; after a further critical four days, rapid improvement occurred, with return of the temperature to normal, disappearance of the temporal headache and a gradual vanishing of the neck stiffness. The urine, which on March 21 had been concentrated and contained much albumin, gradually returned to normal. The dosage of sulphathiazole was reduced and finally discontinued. On April 7 the patient was allowed out of bed, and he finally left hospital on April 29, feeling well.

In a letter dated September 18, 1942, the patient stated that for some time after returning home he had had difficulty in walking straight, but he had gradually regained his sense of balance; in addition, two weeks previously there had been a slight "flicker" at the corner of his mouth, and since then he had been able to move the lower left part of his face. Moreover, he had returned to full-time work two months previously.

During his second stay in hospital 97 grammes of sulphapyridine, six grammes of sodium sulphapyridine and 125 grammes of sulphathiazole were given—a total dosage of 228 grammes of these drugs. In all, during the whole illness, 269·5 grammes were administered.

Comments.

This case illustrated many of the difficulties that may occur in the management of pneumococcal meningitis. In view of the tendency to exacerbations and relapses, full dosage of sulphapyridine should be given till the patient appears clinically well and has been afebrile for seven days; then the dose should be halved for several days and gradually discontinued. Should a relapse occur, maximum dosage should again be administered, for experience has shown that a relapse is more difficult to control than the initial infection. One disadvantage of the oral administration of sulphapyridine is its tendency to produce nausea and vomiting, resulting in a variable absorption. This can be overcome by the giving of sodium sulphapyridine intravenously in a 5% solution of distilled water. Hodes, Gimbel and Burnett,[3] in a series of seventeen cases with eight recoveries, treated their last four patients with sulphapyridine given orally and intravenously, with a resultant higher and more constant concentration of the drug in the cerebro-spinal fluid; they aimed at a level of 10 to 15 milligrammes per 100 cubic centimetres, and recommended the intravenous administration of at least five grammes each day during the critical period of the illness.

When large doses are being administered over an extended period, complications may arise. In the present case, in which 269·5 grammes were given, a fall in the hæmoglobin percentage and in the numbers of red and white cells occurred in the later stages; the urine also became highly concentrated and contained much albumin. Occasionally acetyl-sulphapyridine crystals are deposited in the renal tract and may produce irritation or obstruction; this should be avoided by adequate fluid intake and alkalinization of the urine. However, in such a serious illness as pneumococcal meningitis, chemotherapy may need to be continued in spite of such complications, since the life of the patient may depend on the efficacy of the drug.

Blood transfusion may at times be a life-saving measure in helping to combat the infection by the production of antibodies and in reducing the anæmia that develops in a long-standing illness. In this case it certainly proved beneficial.

Unfortunately the pneumococcus was not typed, and consequently specific antibody therapy was not considered; according to some authorities, it is of great benefit in certain types of pneumococcal infections.

In this case, the question of the selection of a suitable time for operation arose. Owing to the rapid subsidence of the first attack of meningitis and in the absence of an active lesion, it was decided to wait. However, in the presence of a slight persistent aural discharge for five weeks and a "dead" labyrinth, it was decided to perform a radical mastoid operation. Before this could be done the meningitis recurred, and it was then felt necessary to operate immediately, explore widely and remove all possible infected areas. The lesson to be learnt from this case is that in all cases of pneumococcal meningitis, when an active bone lesion is present or suspected, immediate exenteration of the affected area is essential.

Acknowledgements.

I should like to thank Dr. Walter Williams for the surgical management of this patient, Dr. S. O. Cowen for valuable advice at a critical stage of the illness, and Dr. Margaret W. Ashton for the pathological work.

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STUDIES ON TONICITY IN DEXTROSE-SODIUM CITRATE SOLUTIONS.

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IN recent years numerous fluids have been advocated for the storage of blood, and these have varied widely both in composition and in the volume employed (relative to the volume of blood). In an endeavour to determine which was the most suitable for the preservation of blood which had to be sent long distances by air, attention was directed to the red blood cell itself, and attempts were made to measure changes in shape and in volume of the red cell in various solutions. These findings are reported in this paper.

In 1916 Rous and Turner described a dextrose citrate solution for the preservation of blood.[1a] Since that time the majority of fluids that have been advocated for the storage of blood have contained dextrose and sodium citrate in varying proportions.[1] The sodium citrate is used to prevent coagulation and the dextrose to delay hæmolysis.

[1] More recent studies on the survival of red cells *in vivo* support the inclusion of dextrose in preserving fluid.[2,3,11-14,17]

Both Rous and Turner and their successors have endeavoured to use these two substances in concentrations which were isotonic with blood. Many of the authors estimated the isotonicity of their fluids indirectly by comparing their freezing points with the freezing points of a 0·95% sodium chloride solution or blood serum.[4][10] Maizels, however, investigated changes in volume of the red cell by hæmatocrit determinations,[9] and in the present work a similar method was used. In addition, observations were made on the shape of the red cell. In these techniques the red cell acts as an osmometer[8] and furnishes direct evidence of the tonicity of its environment, whether it be isotonic, hypotonic or hypertonic.

Methods.

Source of Blood.

Human subjects were venesected and the blood was delivered into test tubes six inches by five-eighths of an inch in size, containing an equal volume of the various solutions, whether dextrose citrate or citrate alone. For control purposes the blood from each donor was taken into a dry test tube containing heparin.

Observations on the Size of the Red Cells.

As soon as possible after collection of the blood and at intervals thereafter, well mixed samples were transferred to Wintrobe's tubes and centrifuged at 2,900 revolutions per minute for thirty-five minutes, when packing was complete even in the control tubes. The hæmatocrit reading of the packed cells in the heparinized blood was taken as 100. The readings of the packed cells in the various solutions were expressed in terms of this figure, after correction had been made for dilution. This figure is called the hæmatocrit index. If the solution is hypotonic the index is above 100, and if it is hypertonic the figure is below 100.

Observations on Hæmolysis.

The naked eye appearances of the supernatant fluid after centrifugation were observed.

Observations on the Shape of the Red Cells.

At intervals after the blood had been mixed with the fluid, a drop was removed from the tube, placed on a glass slide beneath a coverslip and examined with a dry lens with the high power of the microscope. The shape of the cells could be observed more accurately by tapping the coverslip lightly, the vibration causing the cells to turn over.

Experimental Observations.

Experiment I: Determination of the Tonicity of Various Citrate Solutions.

Solutions of sodium citrate in distilled water varying from 1·4% to 3·8% in strength were placed in a series of test tubes. Blood from the same donor was mixed with an equal quantity of each citrate concentration. Hæmatocrit determinations were made on the various mixtures and on three heparinized controls.

It was found that maximum change in the cell volume had occurred by the time the first determination could be made, and that thereafter the cell volume remained constant for several days. The blood of twenty different donors was examined in this way, and the hæmatocrit indices of each donor's blood in the different concentrations of sodium citrate solution will be found in Table I. The average index for each concentration has been calculated and is seen in the same table. The average index is also represented graphically in Figure I. It will be seen from the table and the graph that a 2·6% concentration gives an approximate index of 100; that is, 2·6% sodium citrate solution is isotonic with blood according to this method. This statement, of course, assumes that the red cell volume is not altered by heparin.[11]

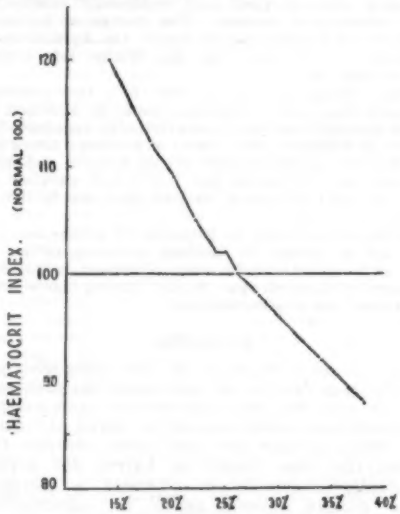

FIGURE I.

Experiment II: The Effect of Dextrose.

Test tubes were set up in four rows, each tube containing ten cubic centimetres of fluid. Tubes in Row 1 contained sodium citrate solution in concentrations

TABLE I.
Hæmatocrit Indices of Red Cells in Varying Sodium Citrate Concentrations.

Donors' Numbers.	Concentration of Sodium Citrate Solutions. (Percentage.)										
	1·4	1·8	2·0	2·2	2·4	2·5	2·6	2·8	3·0	3·4	3·8
1	—	108	—	103	—	—	100	—	91	—	—
2	121	113	—	108	—	—	102	—	98	94	90
3	119	118	—	113	—	—	102	97	97	89	86
4	—	111	111	105	103	—	100	95	95	—	—
5	—	—	108	106	101	—	103	100	102	—	—
6	—	—	108	106	103	—	101	98	97	—	—
7	118	115	—	109	104	102	100	—	96	92	87
8	117	112	—	106	106	102	101	—	101	93	90
9	121	114	—	107	107	103	100	—	93	93	93
10	120	113	—	104	101	101	—	—	96	93	91
11	120	111	—	106	—	105	102	—	98	91	91
12	123	111	—	106	—	103	97	—	94	92	90
13	119	—	—	105	99	100	100	—	94	—	90
14	119	—	—	103	—	102	96	—	97	—	90
15	120	—	—	105	—	101	99	—	95	—	87
16	120	—	—	105	103	—	100	—	—	—	87
17	123	108	—	106	101	101	100	—	96	90	88
18	123	110	—	108	101	103	100	—	97	93	88
19	120	—	—	101	103	100	99	—	97	—	90
20	124	—	—	107	99	103	99	—	93	—	87
Average Indices	120 ±1·96	112 ±2·86	109 ±1·73	105 ±2·5	102 ±2·4	102 ±1·41	100 ±1·63	98 ±2·08	96 ±2·65	92 ±1·56	88 ±1·95

TABLE II.

Effect of Dextrose on Tonicity of Sodium Citrate Solutions (Blood Added to an Equal Volume of Solution).

Interval between Taking of Blood and Centrifugation. (Hours.)	Hæmatocrit Index with Varying Concentrations of Sodium Citrate.								
	6·0%	3·8%	2·6%	1·1%	0·9%	0·6%	0·5%	0·4%	0·3%
No dextrose (Row 1).									
½	80	89	102	133	139 (H)[1]	H	H	H	H
2	80	93	102	129	H[2]	H	H	H	H
3½	—	90	102	127	H	H	H	H	H
5	80	94	102	129	H	H	H	H	H
7	80	93	102	129	H	H	H	H	H
24	77	89	100	129	H	H	H	H	H
48	77	89	98	125	H	H	H	H	H
1·0% dextrose (Row 2)									
½	80	93	102	133	144	158	160 (H)	166 (H)	H
2	80	92	101	133	142	154	H	H	H
3½	80	94	102	131	141	156 (H)	H	H	H
5	78	92	102	133	142	156 (H)	H	H	H
7	78	91	102	129	136	H	H	H	H
24	77	91	103	131	136	H	H	H	H
48	76	88	98	129	136	H	H	H	H
2·0% dextrose (Row 3)									
½	80	95	102	138	142	152	160	171	H
2	82	95	103	133	139	156	159	H	H
3½	—	94	101	131	139	154	H	H	H
5	82	91	104	130	140	151	H	H	H
7	80	93	102	133	138	151	H	H	H
24	80	89	102	131	137	H	H	H	H
48	78	89	104	129	134	H	H	H	H
5·4% dextrose (Row 4)									
½	84	93	105	125	125	138	138	138	138
2	—	94	104	128	128	136	138	142	150
3½	82	93	103	126	129	138	143	148	151
5	86	94	104	129	132	142	142	149	154
7	84	93	106	127	133	140	142	148	151
24	82	93	104	129	132	141	147	153	155
48	85	90	102	130	132	144	144	153	158

[1] (H) = Commencing hæmolysis.

[2] H = Frank hæmolysis.

ranging from 6·0% to 0·3%. Tubes in Row 2 contained citrate solution of the same concentrations *plus* 1·0% of dextrose. In Row 3 the concentration of dextrose was increased to 2·0% and in Row 4 it was increased to 5·4%. In all tubes the citrate concentrations were as indicated at the head of each column of Table II. For instance, the first tube in Row 3 contained six grammes of sodium citrate and two grammes of dextrose per 100 cubic centimetres of solution.

To each tube was added, direct from the donor's vein, an equal volume of blood (ten cubic centimetres). The final dextrose concentrations in Rows 2, 3 and 4 were thus reduced to 0·5%, 1·0% and 2·7%. A specimen was also heparinized in a dry tube to serve as a control. Each was mixed thoroughly and a sample was centrifuged without delay. The control, as before, was centrifuged in triplicate. Samples were centrifuged at frequent intervals up to forty-eight hours. The hæmatocrit indices are set out in Table II.

It will be seen that in Rows 1, 2 and 3 the cell volumes were adjusted rapidly, remained fairly constant for forty-eight hours, and were not influenced by the presence or absence of dextrose. For example, whenever blood had been added to a solution containing 2·6% of citrate, with or without dextrose, the hæmatocrit index was approximately 100. In Row 4 a difference is seen, but only in the hypotonic citrate solutions. Here, although swelling of the cells still occurred, the increase in size was not so great as when lower concentrations of dextrose were present, and it occurred more slowly. Even after forty-eight hours the volume of these cells was still less than that of those containing 0·5% and 1·0% of dextrose (this is, in Rows 2 and 3).

While the table shows that dextrose has little effect on cell volume, it also demonstrates that if dextrose is present the red cell can tolerate a greater degree of swelling without undergoing hæmolysis. This is shown most clearly in the figures obtained with the 0·9%, 0·6% and 0·5% sodium citrate solutions shown in the table. When blood is mixed with the solution containing 0·9% of sodium citrate and no dextrose, hæmolysis commences at a hæmatocrit index of 139; whereas with the solution containing 0·6% of citrate and 1·0% of dextrose, hæmolysis is absent even though the hæmatocrit index is 158; and commences only when the hæmatocrit index reaches 160—that is, in the tube originally containing a solution of 0·5% of citrate in 1·0% of dextrose.

Experiment III: Comparison of Hæmatocrit Indices in Various Recommended Dextrose-Citrate Solutions.

The solutions recommended by Rous and Turner, de Gowin, Officer, Harington and Miles, and the Medical Research Council of the Privy Council were prepared. Their composition and concentrations of dextrose and sodium citrate, and the recommended ratio of blood to preserving fluid, will be found in Table III. In addition, for purposes of comparison, a 2·6% solution of sodium citrate was prepared. Blood was added to each in the dilution recommended by its own author, and in addition

TABLE III.

Name of Author.	Composition of Solution.	Concentrations of Dextrose and Citrate in the Mixture.	Blood : Fluid Ratio Recommended by Author	Final Dextrose Concentration.
1. Rous and Turner.	3·8% citrate, 2 parts. 5·4% dextrose, 5 parts.	1·1% citrate. 3·85% dextrose.	3 : 7	2·7%
2. de Gowin	3·2% citrate, 2 parts. 5·4% dextrose, 13 parts.	0·43% citrate. 4·7% dextrose.	10 : 15	2·8%
3. Officer ..	4·0% citrate, 2 parts. 5·4% dextrose, 10 parts.	0·66% citrate. 4·5% dextrose.	20 : 12	1·7%
4. Harington and Miles.	—	Citrate, 1·05% Sodium chloride, 0·85% Dextrose, 3·0%	2 : 1	1·0%
5. Medical Research Council (War Memorandum No. 1).	3·0% citrate, 5 parts. 15·0% dextrose, 1 part.	2·5% citrate. 2·5% dextrose.	7 : 2	0·55%

the six blood-fluid mixtures were studied over a range of comparable dilutions (30% to 77·8% whole blood). A heparin control was prepared at the same time. All mixtures except the control were placed in the refrigerator and hæmatocrit determinations were made after twenty-four hours. The results are seen in Figure II, each hæmatocrit reading being represented by a point on the curve. The point surrounded by a circle represents in each case the percentage of blood recommended by the author of that particular solution.

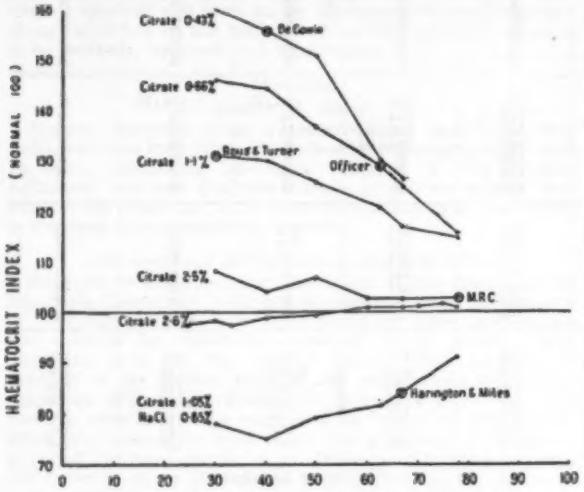

FIGURE II.

As might have been expected from the preceding experiments, hæmatocrit indices were above 100 if the author's fluid contained less than a 2·6% concentration of sodium citrate, and below 100 if the fluid was hypertonic (Harington and Miles's fluid contained isotonic sodium chloride solution and 1·05% of sodium citrate in addition, and was therefore hypertonic). The only solutions which gave hæmatocrit indices approximating 100 were that recommended by the Medical Research Council of the Privy Council (2·5% sodium citrate concentration) and the solution containing a 2·6% concentration of sodium citrate alone.

Experiment IV: Restoration of Cell Volume after Storage.

Those mixtures of Experiment III which had been recommended by the authors were placed in the ice box for ten days. Hæmatocrit readings were again taken; the mixture was then centrifuged and the cells were resuspended in plasma freshly prepared from compatible heparinized blood. Further hæmatocrit readings were taken immediately. It was found that even when the hæmatocrit index of the blood-preservative mixture had been as high as 150 or as low as 85, the hæmatocrit index of the cell-plasma mixture returned rapidly to approximately 100.

Changes in Shape of the Red Cells.

In hypertonic solutions the cells exhibit shrinkage or crenation and in hypotonic solutions they swell. Minor degrees of swelling consist of a slight thickening, whilst in moderate degrees one side of the cell becomes convex, with resulting mushroom-like forms. Grossly swollen cells develop an irregular appearance easily mistaken for crenation; but whereas crenated cells as they turn over are seen to be still flat, swollen cells appear as distended little bags with blunt projections.

Changes in the shape of the red cells are interesting and give a rough and rapid indication of the tonicity of the suspending fluid, but are not amenable to accurate measurement.

Discussion.

Although this work was undertaken for the purpose of determining which preservative solution would be most suitable for the storage of blood, experiments had to be limited to a study of the tonicities of dextrose and sodium citrate solutions, including a number of recommended fluids. It is perhaps reasonable to assume that a solution which is isotonic with red blood cells will be preferable to one which is hypotonic or hypertonic, though no support for this assumption is advanced. It is true, however, that the solution which diverges most widely from isotonicity—that of de Gowin—is likely to fail as a preservative fluid unless special precautions against hæmolysis, such as those recommended by de Gowin himself,[3][4] are taken (cooling of the fluid before the blood is collected, followed by immediate refrigeration of the blood-fluid mixture). The fact that transfusion of blood that has been stored in such a fluid is not attended by untoward intravascular hæmolysis, is probably explained by the ability of swollen cells to revert to their normal volume when resuspended in fresh plasma, as demonstrated in Experiment IV.

In the determination of the isotonicity of any solution with the red blood cell, the method is obviously of great importance. Dating from Rous and Turner's work, 3·8% sodium citrate solution has been widely accepted as isotonic; but it is difficult to accept this when the red cell itself, suspended in this solution, shrinks to 88% of its normal volume and exhibits crenation on microscopic examination.

It is clear that measurement of the volume of the cell in the suspending fluid is a more direct method of determining the isotonicity of the latter than is the determination of its freezing point, and is therefore likely to be more accurate. By means of this method 2·6% sodium citrate solution has been shown to be isotonic, although Maizels, using a slightly different technique,[6] states[3] that a 2·2% to 2·3% concentration is the correct figure.

The only preserving fluid whose citrate concentration approximates to the foregoing figures is that of the Medical Research Council of the Privy Council; it has a citrate concentration of 2·5%, and this solution has been tentatively chosen by the New South Wales Red Cross Blood Transfusion Service for the preservation of blood.

The conclusion that 2·6% sodium citrate solution is isotonic receives additional support from Experiment III and Figure II. When blood is stored, the red cell is suspended in a mixture of preserving fluid and its own plasma. Unless the preserving fluid is isotonic with the plasma, tonicity of the mixture varies according to the proportion in which the two are mixed, and this is reflected by the hæmatocrit index. Thus, with hypotonic and hypertonic solutions the hæmatocrit indices diverge most widely from 100 in those mixtures which contain a relative excess of preserving fluid, and approach 100 as the proportion of blood is increased, whereas with a 2·6% sodium citrate solution, hæmatocrit indices remain constant at approximately 100 throughout.

The Addition of Dextrose.

It has been claimed that a 5·4% dextrose solution is isotonic with blood, as shown by freezing point determinations; but the results obtained in Experiment II (Table II) clearly show that this is not the case. If a 5·4% dextrose solution were isotonic with blood, the addition of even small quantities of sodium citrate would make a hypertonic solution (such as that of Harington and Miles). Yet the hæmatocrit indices (Row 4) do not fall below 100 except in those solutions in which the sodium citrate concentration exceeds 2·6%. It would appear therefore that the red cell membrane does not behave as a semi-permeable membrane so far as dextrose is concerned. Klinghoffer has stated[6][7] that the red cell membrane is freely permeable to dextrose in concentrations of less than 2·3%, but that above this concentration a relative impermeability exists. So far as they go, the results obtained in this experiment agree with this statement.

Dextrose-citrate solutions are usually prepared by mixing autoclaved solutions of dextrose and sodium citrate in convenient proportions. An important conclusion reached from these investigations is that such a mixture is isotonic with blood only if its citrate concentration is isotonic.

The relationship of dextrose to hæmolysis was noted in Experiment II. Maizels has made a similar observation,[25] which he sets out in the following manner:

It follows therefore that cells can attain a much larger critical volume and tolerate a much larger inflow of water without hæmolysis when glucose is present . . . for this reason, stored cells which have lost their impermeability to salts are likely to survive much longer when glucose is added to the anticoagulant. . .

No conclusions were reached in these experiments as to the optimum final concentration of dextrose in the blood-fluid mixture. Reference to the literature[10][22][18] and to Table III shows a variety of recommended concentrations. Table II suggests, however, that at least when hypotonic solutions of sodium citrate are used, a concentration of 2·7% dextrose is preferable to 1·0% or 0·5%, since swelling is retarded, and therefore presumably the liability to hæmolysis is diminished.

Summary.

1. Factors relating to tonicity in dextrose-citrate solutions are discussed.

2. A 2·6% solution of dihydric sodium citrate was found to be isotonic with blood.

3. Addition of dextrose to blood-citrate mixture appears to delay hæmolysis by enabling the erythrocyte to tolerate a greater degree of swelling. The optimum final concentration of dextrose was not determined.

4. Dextrose-citrate solutions are isotonic with blood only if their sodium citrate concentration is approximately 2·6%.

Acknowledgements.

I wish to thank Lieutenant W. S. Sutton for his assistance in carrying out this work. Major-General S. R. Burston, Director-General of Medical Services, has kindly given permission to publish this paper.

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THE SIGNIFICANCE OF GLYCOSURIA IN THE ABSENCE OF DIABETIC SYMPTOMS.

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DURING the last two years we have carried out glucose tolerance tests on 368 subjects in whom glycosuria was detected during routine urinary examinations. The majority of the subjects were recruits for the Army or the Royal Australian Air Force, and in common with the remainder, who were hospital patients, none had any symptoms of diabetes.

The question that had to be decided was whether diabetes, actual or potential, was present, and since several interesting factors were encountered, we think that it is worth while to present an analysis of our findings. This is shown in Table I.

TABLE I.
Blood Sugar Curves of Subjects Showing Glycosuria at Medical Examination

Type of Curve.	Number of Instances.
(1) Normal	113
(2) Renal glycosuria (urine containing reducing substances with no point on the curve above 180 milligrammes *per centum*)	126
(3) Lag curves (normal fasting blood sugar up to 120 milligrammes *per centum*; one or more points above 180 milligrammes *per centum*, but a return to fasting level within two hours)	94
(4) "Diabetic" curves (maximum blood sugar 180 milligrammes *per centum* in more than one specimen, or above 200 milligrammes *per centum* in one specimen, with delayed return to normal levels)	35
Total	368

Peel *et alii* have recently commented on the fact that the discovery of glycosuria is a striking feature of the medical examination of young men called up for military service. In their opinion, decision as to fitness for military service should be made from the patient's history and clinical manifestations. A man with no symptoms of diabetes, but giving a "diabetic" response to the glucose tolerance test, should not be automatically rejected for military service. These authors suggest that such men should be reexamined after they have led their ordinary lives and taken their ordinary diets for a period of three months.

From our own observations we agree with Peel *et alii* in that a diagnosis of diabetes should not be made in the case of an apparently healthy subject on the basis of a single blood sugar curve of the diabetic type. We consider that there are several factors that may cause a normal subject to produce a "diabetic" curve. Failure to recognize the existence of these factors and treatment of the subject as a diabetic may cause actual harm.

On the usual criteria, the 35 subjects in the fourth category of Table I were classified as diabetic and rejected for the Army. Subsequently, the wisdom of this procedure was questioned. It is well recognized that emotion, mental stress and worry may provoke glycosuria in normal persons. Furthermore, it is known that previous diet may influence the blood sugar response to glucose; thus starvation, or in some cases the mere restriction of intake of carbohydrate for twenty-four to forty-eight hours, may produce a diabetic type of curve. There is evidence that both these factors had affected many of the subjects investigated, and the procedure now adopted is that if in the absence of diabetic symptoms a blood sugar curve at all questionable is produced by a patient who is nervous on examination or has been dieting, he is told to take a normal diet for two or three weeks and then come back for reexamination.

The Effect of Emotion on the Blood Sugar Curve.

The following cases afford good examples of the effect of emotion on the blood sugar curve. The figures given represent the blood sugar response at intervals of half an hour to 50 grammes of orally administered glucose.

CASE I.—The subject was a Royal Australian Air Force recruit referred for investigation of glycosuria. The fasting blood sugar level was 104 milligrammes *per centum*, and at intervals of half an hour from then on the figures were 191, 163, 135, 111. A specimen of urine tested at the end of one hour contained glucose. Normally this "curve" would be regarded as one of the "lag" type. The patient, however, was extremely nervous, and it was thought that the high peak might be due to this. Accordingly, the test was repeated two weeks later with the following result: fasting level, 96 milligrammes *per centum*; at intervals of half an hour, 161, 141, 113, 93 milligrammes *per centum*.

In the following two cases, if reliance had been placed on the result of a single test, an incorrect diagnosis would have resulted.

CASE II.—The first test produced the following result: fasting blood sugar level, 101 milligrammes *per centum*; levels at half-hour intervals thereafter, 184, 191, 166, 125 milligrammes *per centum*. The test was repeated two weeks later, with the following results: fasting blood sugar level, 111 milligrammes *per centum*; levels at half-hour intervals after, 191, 168, 84, 86 milligrammes *per centum*.

CASE III.—The first test gave the following results: fasting blood sugar level, 102 milligrammes *per centum*; levels at half-hour intervals after, 177, 222, 213, 166 milligrammes *per centum*. The second test gave the following results: fasting blood sugar level, 92 milligrammes *per centum*; levels at half-hour intervals after, 168, 145, 70, 74 milligrammes *per centum*.

In both Case II and Case III nervousness was apparent.

The Influence of Diet on the Blood Sugar Curve.

As has already been mentioned, restriction of food intake may result in a diminished glucose tolerance in a normal subject. In the case of some of the recruits who produced a "diabetic" blood sugar curve, ketone bodies were found in the urine. Suspicions were aroused as to whether the recruit had been voluntarily fasting, and on his being taxed with this, it was admitted. The usual story was that he was anxious to join the forces, and if he had to have "a test for the sugar" he would try to "trick" the test by not eating for a day or so. In such instances the fallacy of such reasoning was pointed out, and the test was repeated after the subject had taken a full diet for two or three weeks.

The following is an example of such a case:

CASE IV.—The subject had symptomless glycosuria. The results of the first investigation are set out in Table II.

TABLE II.

Blood Sugar Level. (Milligrammes *per Centum*.)[1]	Urine.	
	Reducing Substances.	Ketone Bodies.
108	0	+
200	++	++
257	+++	+
173		
123		

[1] First figure, fasting; others, levels at half-hour intervals after the ingestion of 50 grammes of glucose.

This patient admitted to having restricted his diet for seven days prior to the test. A repetition of the test two weeks later gave the following results: the fasting blood sugar level was 100 milligrammes *per centum*; at half-hour intervals it was 175, 145, 81, 80 milligrammes *per centum*. The urine contained no glucose or ketone bodies.

The question of previous diet is one that must be constantly kept in mind if one is to interpret correctly the results of a glucose tolerance test. The following case will further emphasize this point.

CASE V.—Mrs. E., aged forty-eight years, had been operated on for acute appendicitis in 1936. Glycosuria was present, and she had a fasting blood sugar level of 145 milligrammes *per centum*. She was given a low carbohydrate diet, and one week later the result of the glucose tolerance test was as follows: fasting blood sugar level, 80 milligrammes *per centum*; at half-hour intervals, 190, 140, 150, 160 milligrammes *per centum*.

After leaving hospital this patient, still receiving a low carbohydrate diet, returned at intervals for further blood sugar tests. The findings are given in Table III.

TABLE III.

Date.	Blood Sugar Levels. (Milligrammes *per Centum*.)[1]
13. 7.36	120, 130, 140, 155, 160
15. 1.37	111, 150, 195, 195, 193
12.10.37	89, 159, 168, 179, 175
14. 4.42	90, 138, 178, 184, 179

[1] First figure, fasting level; other figures, levels at half-hour intervals after the ingestion of 50 grammes of glucose.

During this period of approximately six years this patient, although having no symptoms of diabetes, was maintained on a "diabetic" diet. It was suggested that she be given a normal diet, and after one month of this the glucose tolerance test gave the following results: fasting blood sugar level, 120 milligrammes *per centum*; levels at half-hour intervals, 173, 146, 129, 99 milligrammes *per centum*.

It seems reasonable to suppose that, in common with all infective processes, the original appendicitis had caused a decreased glucose tolerance. This would in all probability have disappeared; but unfortunately, owing to the low carbohydrate diet, it was maintained.

Summary.

The importance of emotion and previous diet in influencing blood sugar levels is discussed. In our opinion a subject showing symptomless glycosuria should not be classified as "diabetic" as the result of a single glucose tolerance test.

Acknowledgement.

We are greatly indebted to the Director-General of Medical Services, Royal Australian Air Force, for permission to publish some of these cases, and to Squadron Leader Lemmon for his helpful cooperation.

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Reports of Cases.

SAP DERMATITIS AND CONJUNCTIVITIS CAUSED BY THE WILD FIG (FICUS TUMILA).

By P. B. ENGLISH,
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AND
L. P. GREY,
Captain, Australian Army Medical Corps.

Report from the Unit Medical Officer.

WHILE stationed in Darwin with a working party in September, 1942, several men reported to the regimental aid post for attention. They were suffering from blistering of the skin (mainly that of the forehead, cubital fossæ and genitals), intense conjunctivitis and severe catarrhal irritation of the naso-pharynx. The men had been engaged in clearing and burning off in a certain area which contained two wild fig trees (*Ficus tumila*) and a fairly old bomb crater. Irritant chemicals of a blistering type from the crater or the copious sap from the fig trees were suspected of being the cause of the condition. However, experiments with the sap of the fig and control experiments with sap from other nearby trees were carried out, and it was found

that only the fig sap produced typical erythema and vesiculation on the forearms. The potency of the sap can be judged by the fact that when it was gently rubbed over a moistened area of the forearm, vesiculation appeared in twelve hours, in spite of the fact that the subject had had a swim in the ocean one hour after the sap had been applied.

In the two most severe cases the patients when first examined were lying on the floor complaining bitterly of the pain in their eyes and the irritation of their nose and skin. Their eyes were lachrymating freely, and their vision soon became blurred and shortly after was much impaired. Their eyes were bathed and then they had a shower; this caused an exacerbation of their eye condition, presumably owing to further contamination from their hair. Because of the pain and irritation the patients were each given an injection of morphine before being sent to hospital.

In all, five men were sent to hospital and about ten men reported to the regimental aid post with mild symptoms which soon cleared up. Practically all the men working on that area were affected in some way.

Description of the Lesions.

Nasal symptoms varied from mild tickling in the nose to severe irritation of the nose and throat, with copious sticky coryzal secretions from the nose. Except in the severe cases, the nasal irritation soon disappeared. The presence of nasal irritation suggested either the action of vapour from the sap or the passage of sap from the eyes via the naso-lachrymal duct.

The skin lesions varied from a blotchy erythema to a papulo-vesicular eruption, some of the vesicles attaining the size of a large pea. Three sites were chiefly affected, the rest of the body being fairly free: (i) the forehead, (ii) the cubital fossæ and (iii) the genitals. The reasons why these areas were primarily affected were possibly (a) the fact that the men wiped sweat off their foreheads with sap-contaminated forearms and (b) the fact that the sweat carried the sap on their bodies down to the scrotum and penis. The forehead and elbow regions soon settled down, and the skin commenced desquamating in about a week. The scrotum and penis were affected in three cases; in twenty-four hours areas at the peno-scrotal junction and on the prepuce became denuded of epithelium, fairly large raw areas being left. These settled down upon the application of zinc cream.

The Eyes.

Four soldiers were admitted to an Australian general hospital on September 25, 1942, showing varying degrees of eye reaction to an irritant. These men may be referred to as A, B, C and D.

In the case of A, mild conjunctivitis was present in both eyes, with severe photophobia. No corneal damage was evident. Irrigations were given and the conjunctivitis subsided in about three days; but the photophobia persisted for about another four days. Fluorescein produced no staining at any stage, and on the patient's discharge from hospital his vision was $^6/_6$ in each eye. It is interesting to note that in this case vesiculo-bullous lesions of the penis and scrotum with a serous exudate and later crusting were present; the lesions resolved in about six days.

In the case of B, the conjunctivitis in both eyes was intense; some chemosis and slight œdema of the lids were present. The conjunctival injection was mainly in the inter-palpebral area; but by the day after the patient's admission to hospital the injection had become generalized, and the œdema of the lids had practically disappeared. There was no evidence of damage to the cornea. The conjunctivitis gradually diminished until on October 5 it was only slight. The patient was discharged from hospital on October 9, when his vision was $^6/_6$ in each eye. There were no skin lesions in this case.

The patient C had a large area of the left cornea denuded of epithelium, which stained with fluorescein; moderate conjunctivitis was present in the right eye. Photophobia was most pronounced; but no œdema of the eyelids was present, and there were no skin lesions with the exception of a few small vesicles on the forearm. On September 26 the area of staining had considerably diminished, and it had disappeared by September 30. The conjunctivitis gradually subsided, and the patient was discharged from hospital on October 8. At that time his vision was as follows: in the right eye, it was $^6/_6$ with a plane lens; in the left eye, with a $+0{\cdot}25$ diopter spherical lens and a $-1{\cdot}0$ diopter cylindrical lens with its axis at 180°, it was $^6/_6$.

In the case of the patient D, large areas of each cornea were denuded of epithelium and stained with fluorescein. Most intense conjunctival and ciliary injection and some œdema of the lids were present. The area of corneal ulceration in each eye cleared up rapidly, and by September 30, five days after the patient's admission to hospital, it had resolved completely. This soldier, who was the axman of the party, had a large number of vesicles over the forehead, neck and shoulders, and vesiculo-bullous lesions on the forehead, penis and scrotum. These skin lesions had completely cleared up within six days. The condition of the eyes gradually improved; the conjunctival and ciliary injection lessened, and the patient was discharged from hospital on October 12. In this case it would appear that some permanent damage to the cornea resulted, since there was a small nebula over the right pupil, which persisted. When allowance for $+0{\cdot}50$ diopter of astigmatism was made, the patient's vision on his discharge from hospital was $^6/_6$ in the right eye and $^6/_9$ in the left eye with a plane lens.

Comment.

In none of these cases were any infecting organisms disclosed on cultural examination. It seems that in the fourth case permanent impairment of vision in the left eye was due to the action of the irritant sap; hence the need for taking precautions when working near *Ficus tumila*.

Acknowledgements.

We wish to thank the Director-General of Medical Services for permission to publish this report, and also Captain De Garis for information supplied.

PERFORATED TUBERCULOUS ULCER OF THE BOWEL.

By R. CECIL BLACK, M.B., B.S.,
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I WISH to record a case of ulcerative tuberculosis of the intestine, which demonstrates remarkably well the pathology of the condition as well as some unusual features.

Boyd[1] in his text-book states that "the condition is usually associated with the presence of large cavities (in the lungs) . . . and is found in from 50 to 80 per cent. of the cases which come to autopsy". Concerning the pathogenesis, he states that "the bacilli are then carried through the epithelial lining (of the glands) by phagocytic cells, and thus reach the submucosa where they give rise to the usual tuberculous lesions. The overlying mucosa may now be cast off with the formation of an ulcer, or it may remain intact so that the bowel may be tuberculous though not an ulcer can be seen". Of the actual lesions, he states that "in the small bowel the ulcer may extend as far as the peritoneum . . . small tubercles can be seen on the serous coat, or they may be covered up by a plastic exudate. The overlying peritoneum is usually thickened so that perforation is uncommon. . . . Complete perforation into the general peritoneal cavity occurs in the small intestine where the ulcers are deeper, but it is not common owing to the thickening of the peritoneum".

Clinical Record.

The patient, a man, aged fifty years, had not seen a doctor for many months prior to his death. The only history I could obtain when I was called to perform the post-mortem examination was that he had been ill for a few weeks and had vomited very dark fluid shortly before death.

Post-Mortem Findings.

The man was of slight build and poorly nourished. The abdomen was very distended, and there was some dark fluid in the buccal cavity.

Examination of the lungs revealed extensive long-standing tuberculosis and silicosis. There was no cavitation.

Acute general peritonitis was present. A search revealed a perforation, about one-quarter of an inch in diameter, in the jejunum, about two feet from the upper end. This proved to be a perforation of a small ulcer which macroscopically appeared typically tuberculous. One small spot near by showed very early ulceration with the characteristic tubercles in the overlying part of the peritoneum. No other ulcers were present in either the small or the large intestine; but a few areas in the small intestine had typical tubercles on the serous coat, the corresponding areas of mucous membrane showing slight inflammation, but no ulceration.

Dr. E. H. Derrick reported as follows on the findings on pathological examination: "A section was made of the edge of the perforation and another of the unperforated ulcer. Both sections showed typical tuberculous tissue. The condition is interesting in that perforation of tuberculous ulcers is rare."

Discussion.

Here we have a case of bowel tuberculosis in an adult without cavitation of the pulmonary lesion. The small number of ulcers (two only) is unusual, although other portions of the bowel were certainly tuberculous. One would not expect that one lesion would progress rapidly to perforation when other lesions were only in the early stages. The absence of any reaction around the perforation which would have represented an attempt to wall off the process is uncommon. This particular lesion must have progressed with great rapidity in a man who would have been expected to have a certain amount of immunity because of his chronic pulmonary lesion. Death was due to the overwhelming effects of acute general peritonitis.

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Reviews.

WARTIME ADVICE TO DIABETICS.

WITH a steady increase in food rationing in England, Dr. Lawrence has found it necessary within six months to produce a second edition of his wartime advice to diabetics.[1] In a short pamphlet he points out that the dislocation caused by air raids and irregular deliveries may render a person with severe diabetes liable to special dangers when unable to procure food or insulin at the proper hours of the day. Persons with mild diabetes not requiring, or taking only small doses of, insulin, can withstand a deprivation of insulin for a few days without danger, but those with more severe diabetes may develop serious complications within twenty-four hours. The Diabetic Association has influenced the Ministry of Health to provide special rations and advice for diabetics. The association issues free of charge a card giving the usual dose of insulin taken by the patient, the treatment for an overdose of insulin and the usual doctor's name and address. It is advised that this should be attached to the national identity card. The information that the patient has diabetes should also be stamped on his identity disk. Patients who have received their insulin, but who have been deprived of their meals, are advised to take some sugar or sweets to the air-raid shelter. Air-raid wardens have apparently had some instructions in the treatment of hypoglycæmic attacks. Diabetics travelling far from home, who are prevented from returning by an air raid, are advised to carry a spare syringe and insulin with them. It appears that plentiful stocks of insulin exist in Britain today. The patients are advised to keep a slightly increased stock in their homes. The economy of using the higher strengths of insulin solutions, both for themselves and in the interests of national economy in glassware, is pointed out in this brochure. If a diabetic cannot get his usual insulin, he is advised to continue to eat his usual carbohydrate, but no fat and only a little protein. If supplies are short, it is better to take smaller doses more frequently—for example, ten units every eight hours have a better effect than thirty units once a day.

It appears that early in the war English diabetics were permitted to surrender their sugar ration for extra protein and fat rations; since then extra cheese and milk have been made available for diabetics. Two extra rations of butter and/or margarine are allowed per week, providing 71 grammes of fat per day. At first the diabetic was granted one extra meat ration, but the size of this has since been increased and two extra meat rations are allowed in certain circumstances. Since then cheese and milk have been added, both rich in protein. Dr. Lawrence then proceeds to quote the effect of these changes on his "line ration" scheme, pointing out that the black portions should now be one and a half times the red portions. The black portions, which contain the carbohydrate, must be spread over the day according to the doctor's instructions, but the red portions can be taken as desired, and the rationing regulations do not permit of the taking of any excess of protein and fat. Insulin has solved most of the difficulties by enabling more starchy foods to be eaten and utilized and an increase in the number of diabetics taking insulin has become necessary, but insulin confers its own special advantages. Fruit is largely unavailable to the English public, while tomatoes and lettuce are frequently quite unobtainable. Raw winter salads made from grated cabbage, sprouts, carrots, turnips, celery, leek, cress *et cetera* are of necessity becoming the rule, and if carefully prepared with an appropriate dressing, can be made very appetizing. Special diabetic foods are a thing of the past in England today. Vitamin *C* is adequately provided by such salads and by cauliflower, parsley, spinach, turnip and broccoli tops. British margarine is fortified with vitamins *A* and *D*, while the new national wheatmeal loaf takes care of vitamin *B*. This valuable little book concludes with an assortment of recipes for winter salads and dressings. The Australian diabetic will fortunately not require to juggle with fat and protein rations, but none the less may often be in difficulty as regards vitamin *C*, particularly in 1943. The recipes for winter salads form a sufficient reason alone for the purchase of this valuable little guide.

[1] "The Diabetic ABC War-time Supplement", by R. D. Lawrence, M.A., M.D., F.R.C.P. (London); Second Edition; 1942. London: H. K. Lewis and Company, Limited. 8¼" × 5¼", pp. 15. Price: 9d. net.

A BOOK ABOUT PAPUA.

PAPUA, which figures so largely in the news at the present time, is the subject of a fascinating book by Frank Clune.[1] Mr. Clune spent five weeks "prowling through" the country in the days before it became a battle-ground, and his wide observations and constructive suggestions for its more satisfactory development are worthy of attention. The book is written in his usual inimitable style, and holds the reader's interest throughout. If we may assume for a moment the cloak of the carping critic, we would say that although the tricks that Mr. Clune plays with words are generally interesting and amusing, sometimes they can be exasperating; the word "riparian", for instance, is much overworked—it appears with monotonous regularity. But this is a small matter, compared with the wealth of information that has been packed into 237 pages. Here we may find a faithful record, from early days to the present, of the exploring expeditions that made possible the opening up of valuable country and the taming of thousands of cannibalistic natives. So vividly are the stories of the various expeditions told that we follow them avidly, free from the boredom that too often accompanies the reading of such accounts, and we cannot fail to feel a profound respect and admiration for the brave men who risked their lives with no thought of personal gain, that the unknown land might be laid open. Not the least valuable work in this regard has been done by missionaries and by government officers. From what he has learnt and seen for himself, Mr. Clune believes that Papua could play an enormous part in post-war reconstruction. The country needs developing. In the past the government policy has largely favoured the preservation of the *status quo* for the natives—*minus*, of course, such outmoded customs as the practice of cannibalism. But in Mr. Clune's opinion the natives have reached a stage of development at which they are eager to work for the white man, and they look to him "to raise their standard of living and civilization, by giving them opportunities to work for wages". A further suggestion is that natives should be put to work at once clearing vast tracts of jungle, to be planted with rubber trees and other crops that are slow to mature; "the improved land should be made available on easy purchase terms to demobilized soldiers and munition workers immediately the war ends—instead of gratuities and service pensions". This is a thing that should be done only after the most careful choosing of settlers who would need to be endowed with extraordinary powers of endurance, adaptation and understanding. There is no doubt that the campaign in Papua has roused in Australia a great deal of public interest in that little-known land, and not the smallest cause of that interest has been the loyal service rendered by the "fuzzy-wuzzy angels". Perhaps, when the tumult and the shouting dies, Papua will be given representation at Canberra and its own legislature, as Mr. Clune urges.

We would finally commend to our readers Mr. Clune's description of the benign tertian malaria to which he was a martyr for a great part of his travels in Papua—entirely because of his refusal to be warned and to take quinine; it is an illuminating representation of the patient's feelings in such circumstances.

[1] "Prowling through Papua", by Frank Clune: 1942. Sydney: Angus and Robertson, Limited. 8¼" × 5¼", pp. 251, with 16 illustrations. Price: 12s. 6d.

The Medical Journal of Australia

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All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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FOOD AND THE FUTURE OF THE NATIONS.

"HEALTH is the foundation of well-being, and an adequate diet is the foundation of health." These words are used by Sir John Boyd Orr, Director of the Rowett Institute and chief of the Imperial Bureau of Animal Nutrition at Aberdeen, in the course of an important article on the role of food in post-war reconstruction, appearing in the *International Labour Review* of March, 1943. They are known by medical hygienists to be true and indeed doctors seek continually to put them into practice in their every-day work. No medical practitioner on the preventive or curative side is doing his duty, and no practitioner can hope that his labours will be really effective, if he neglects the nutrition of those in his charge. In 1939 Sir Robert McCarrison, known the world over as an expert on nutrition, put the matter clearly in three short sentences at a national conference on the wider aspects of nutrition (see THE MEDICAL JOURNAL OF AUSTRALIA, December 30, 1939). His first statement was that nutrition is a fundamental function of the body on the efficiency of which health depends; he went on to say that food, as an instrument of nutrition, is the paramount influence in determining man's general physical endowment, powers of endurance, and resistance to disease; he added that a well-constituted diet, made up of natural foodstuffs, contains all things needful for normal nutrition. What is true in this regard of the individual is true of large groups of persons comprising a community or nation. No one would be so foolish as to maintain that nutrition of the first order would of itself bring about the well-being of a nation; but he would be thrice foolish who did not regard it as of basal importance to such well-being. Whether it is a single person or a body of persons that is concerned in the maintenance of nutrition, two factors always have to be considered, and these are the production of food and its distribution or availability. These matters may be outside the strictly medical limits of the subject, but the medical sociologist must consider them. As a matter of fact every intelligent man and woman should know something about the production and distribution of food, and the doctor more than most because the success of his work depends in such large measure upon them. The doctor's point of view in regard to some food matters is so fundamentally different from that of other persons and groups of persons that it should be emphasized. This was a point made by Sir John Salter at the national conference in 1939, previously mentioned. Milk, the example he quoted, is so often treated primarily as an important source of income for farmers, and only secondarily as the most essential of foods. There is no doubt that the medical point of view should be considered in any discussions on national food supply—production or distribution.

Investigations of national food problems have been undertaken in many countries and the body chiefly responsible has been the League of Nations. It will be remembered that the League of Nations in 1935 set up its Mixed Committee to study both the health and the economic aspects of the nutrition problem, including amongst its members agricultural, economic and health experts. The committee issued an interim report and a final report which was published in 1937. The committee recommended that nutrition should be studied as a scientific problem and that surveys should be made in different countries to determine what degree of malnutrition existed. It declared that sufficient security against the risks of malnutrition was not achieved in any country; it also insisted that for any nutritional policy to be effective, the problem had to be recognized as one of primary national importance. A great deal of time was spent and an enormous amount of energy was expended in the nutritional activities of the Mixed Committee of the League of Nations and in the activities of the many committees that it called into being in different parts of the world. Though some persons have wondered whether the results have been worth while, it must be evident to most people that the nutritional value of food is much more a subject for discussion and a guide in its selection than was the case even ten years ago. This is all to the good, and, incidentally, whether all or the greater part of the altered outlook is due to the League of Nations does not matter. A time has come when people in many different parts of the world are beginning to think along international rather than along national lines. This changed attitude of mind is the inevitable effect of the war on the minds of intelligent men and women who see in international cooperation and blending of ideas the only chance of saving civilization from complete disintegration. It was not for nothing that Mr. Winston Churchill and President Franklin D. Roosevelt drew up what has become known as the Atlantic Charter, declaring "certain common principles in the national policies of their respective countries on which they base their hopes for a better future for the world". The fifth clause of the charter states the desire of its authors "To bring about the fullest collaboration between all nations in the economic field with the object of securing, for all, improved labour standards, economic advancement and social security". In the light of this clause in the Atlantic Charter it is well to recall the declaration of the Mixed Committee of the League of Nations that sufficient security against the risks of malnutrition is not achieved in any country and also

the view that the maintenance of a high standard of nutrition is of basal importance to the well-being of any nation. From these considerations it at once becomes apparent not only that the post-war food problem will be acute, as everyone will readily agree, but that the future of the nations, their peace and prosperity, will depend in no small degree on the wisdom with which it is handled.

That the need for concerted action is recognized is shown by the holding of a United Nations Food Conference at Hot Springs, Virginia, United States of America. So far only short cabled notes of the proceedings have reached this country, the latest being a statement of what the minimum weekly diet should comprise. A speech by the President of the United States to the delegates at the conclusion of the conference has also been broadcast. It is safe to conclude that the conference was not one at which desiderata only were discussed and stated, but that a start was made with the laying down of plans which will have to be far reaching and unique. Some idea of what will be needed in the future may be gained from the article by Sir John Boyd Orr from which a quotation has already been made. As a matter of fact what this author writes is so much to the point that it should be reprinted and put into the hands of hygienists, parliamentarians and other public men. Sir John Boyd Orr points out that European agriculture before the war was to a large extent adopted for national self-sufficiency as a safeguard against food shortage in war. He states that if European countries adopted a food policy based on the nutritional needs of the people on the health standard, agriculture would have to be adjusted to a greatly increased production of milk and other protective foods, with a resulting decreased production of certain other foods, especially wheat and sugar, "which in any case are uneconomical crops for western Europe from the point of view of world trade". This is one of the reasons advanced for the making of decisions without delay—if long-range plans are not made at once, post-war food relief will bring Europe back on to its agricultural war policy, instead of on to an "agricultural nutrition policy" and we shall be back in 1938. There is another very good reason why concrete plans should be made now and not later. The governments in different countries will not all interpret in the same way such expressions as "freedom from want". Sir John Boyd Orr holds that the only way to ensure united action after the war is to secure agreement on a plan expressed in concrete terms, about which there can be no ambiguity, "not even a pretence of misunderstanding". The plan must be one which can be applied in its initial stages in the free countries while the war is still being waged, and in the occupied countries as soon as they are liberated. The minimum weekly diet decided on by the United Nations Food Conference is reported to include at least ten pints of milk, four eggs, one and a half pounds of meat, fish and poultry, five pounds of fruit and vegetables, three-quarters of a pound of sugar and five pounds of fats, potatoes and nuts. The difference between available supplies of milk, dairy products, fruit, vegetables, eggs and meat and the amount that would be needed if the whole world were to have the minimum diet described by the United Nations Food Conference, is enormous. If the minimum diet is to be made possible, agricultural and farming pursuits will have to claim many more adherents than they do today. But that is not the whole story; if it were, it would have too much of a national and not enough of an international ring about it. All countries are not suited for the production of every kind of food; an international exchange will always have to take place. But the exchange should not be a haphazard arrangement; international trade in food should be on a planned basis and planning should cover total requirements, production and disposal of food. To use Sir John Boyd Orr's expression, plans will be made as to how the larders are to be filled. Each country would produce as much of the essential, and particularly the protective, foodstuffs as it could; what was lacking would have to be obtained from other countries—from the international larder. As an example of what would be needed Sir John Boyd Orr points out that if food requirements on a health standard are to be met in the United States, 40,000,000 more acres of food and feeding stuff crops will have to be grown. Without going into details, we may point out that, according to Sir John Boyd Orr, if an "agricultural nutrition policy" is to be carried out in Great Britain, increased production and increased imports will be necessary. In addition to an international organization to enable the nations to cooperate in the production of foodstuffs, each nation would need to have a national body to control the domestic production and the distribution of food within its own borders. Considerations of space make it impossible to describe in detail the kind of organization that Sir John Boyd Orr visualizes for Great Britain. In short he would set up a National Food Board operating through a number of commodity boards. He is optimistic enough to believe that such a board could be run on business lines without any bureaucratic interference, and he thinks that in all its activities, except the central control, it should be subject to the stimulating effect of competition. Since we must forbear to discuss the details of Sir John Boyd Orr's scheme, we must also refrain from observations based on certain Australian conditions that might be made regarding things that should not be allowed to happen—the distribution of food in Australia under existing conditions merits a separate discussion.

Whatever we may think of the points in Sir John Boyd Orr's contribution and of the way in which he links them together, the subject of food for the nations in the future is one that cannot be ignored. The people of Australia have shown that they are in earnest about the conduct of the war. The war will not end with the laying down of arms. The people in the occupied countries and in the countries which have been ravaged by war will have to be fed and we shall want to feed them to the best of our ability. No one will refuse the suggestion that this should be done in an orderly fashion and according to a coordinated and pre-arranged plan. And if needy people are to be fed they must be fed in such a way that they will without undue delay recover their normal health and vigour. Security against malnutrition is one of the objectives to be achieved by this war. In Australia we can do a great deal towards its attainment and for the process we shall need men of fearless opinions and long vision. Such men will not be influenced by little Australians. Perhaps when the report of the United Nations' Food Conference is known our governmental authorities may take us into their confidence and announce what they intend to do to increase food production for the needs of the future.

Current Comment.

SICKLE-CELL ANÆMIA.

SICKLE-CELL ANÆMIA is a familial disease almost confined to Negroes and mulattoes. Its chief feature is hæmolysis. It is characterized by a tendency to remissions and exacerbations, and it may be manifested by abdominal pain, pains in joints, jaundice, and ulceration of the legs. It derives its name from the appearance of the erythrocytes, which are sickle-shaped or oat-shaped. The presence of these sickle cells in the blood is not necessarily indicative of anæmia—at any rate severe anæmia. It has been said that they may be found in the blood of 7% of Negroes. Such persons are said to be affected with sicklæmia or sicklanæmia. The abnormality of sicklæmia is transmitted from generation to generation as a Mendelian dominant with no sex linkage. Unless a person is actually suffering from very severe anæmia, the sickle cells are not found in a stained smear; but if a wet preparation is made and kept warm and airtight, and reexamined after twenty-four hours or more, the majority or all of the red cells will be found to have assumed the characteristic sickle shape. Normal red cells never become sickle-shaped. It is said that the number of sickle cells seen in a direct smear may be taken as an index of the severity of the anæmia. Hahn and Gillespie have shown that the development of the sickle appearance *in vitro* is due to a diminution in oxygen tension; they state that the phenomenon occurs only when the oxygen partial pressure has fallen below 45 millimetres of mercury. They suggest also that cardiac and pulmonary disease, by causing anoxæmia, may induce the development of sickle-shaped cells in persons who are congenitally susceptible or may increase the numbers of sickle cells where they already exist. Whitby and Britton are careful to point out that there is no relation between sickle-cell anæmia and ovalocytosis, a phenomenon that is not associated with anæmia.

The spleen in sickle-cell anæmia is either enlarged or fibrotic and atrophic. Osteoporosis is common. The bone marrow is hyperplastic, and contains sickle cells. The liver, spleen and kidneys contain blood pigments and iron.

Patients affected with sickle-cell anæmia suffer from dyspnœa, dizziness, vomiting, and pain in the epigastrium or splenic region. The sclerotics are icteric, and the blood serum gives an indirect reaction to the Van den Bergh test. In acute exacerbations of the disease the abdominal pain may resemble the gastric crises of *tabes dorsalis*. At these times intermittent febrile paroxysms may occur. Pains in the joints may be of great severity and may persist for some weeks.

The prognosis in true sickle-cell anæmia is grave. Sufferers do not usually live beyond middle age. They are highly susceptible to infectious diseases, which tend to cause an increase in sickle-cell formation, and, of course, are particularly dangerous to such anæmic persons. Intercurrent infection is the commonest cause of death. It is also a possible cause of exacerbation of the disease or of the development of anæmia in a susceptible person. Treatment consists solely of efforts to repair the blood loss. Correction of the underlying constitutional disorder is impracticable.

The study of sicklæmia and sickle-cell anæmia in two families of supposedly pure white stock has prompted M. A. Ogden to produce a paper on the subject.[1] His first patient was a nine year old girl, born of Spanish parents in New Orleans. She had been jaundiced all her life, and she was liable to repeated illnesses characterized by "sore throat". A maternal aunt had died at the age of fourteen years and the maternal grandmother at the age of thirty-five years; the history in each case was suggestive of sickle-cell anæmia. There was no history suggestive of the disease on the paternal side of the family. Sickle cells were found in the blood of the patient's mother, sister and brother (there were no other siblings). Laboratory examination of the patient's blood revealed the phenomena characteristic of sickle-cell anæmia. Inquiry into the family history elicited no information to suggest that the stock was not purely white. However, a reproduction of a photograph shows the whole family to be dark-complexioned, and the facial appearances of the patient and her mother are not inconsistent with a Negro ancestry.

Ogden's second patient was an eight year old boy, who had been admitted to hospital for the treatment of "rheumatic fever" (the quotation marks are Ogden's). Careful and persistent inquiry into the family history elicited the fact that the boy's maternal great-grandfather was a mulatto and his great-great-grandfather was a Negro. The three other siblings of the patient's family (two boys and a girl) and the patient's mother were all found to have sickle-shaped cells in their blood. The patient's maternal aunt and maternal grandmother were unaffected. The maternal grandfather had died at an early age. The patient was jaundiced, and his knee joints and ankle joints and his thigh muscles were tender to pressure. Examination of the blood revealed the appearances characteristic of sickle-cell anæmia. The liver was found to be enlarged on clinical examination, but not the spleen. According to Ogden the patient was not in the least negroid in appearance, while his mother had crisp, curly hair and a rather wide flat nose, although her skin was light. An interesting feature is that all the children inherited their father's blood group (*A*). The mother's group was *O*.

In an endeavour to estimate the racial incidence of sicklæmia, Ogden examined the blood of 910 white people and 692 Negroes who attended consecutively at a hospital out-patient department in New Orleans. He found evidence of sickle-cell anæmia in seven Negroes and he found sickle-cell formation without anæmia in 38 Negroes, a total of 45, or 6·5%, whose blood contained sickle cells. None of 910 white people was affected. It is of interest, and possibly of importance, to note that of 37 females with sickle cells, only two had anæmia, while of the seven affected males, five had anæmia. Ogden found no evidence of precipitation of anæmia by any particular illness in his large series of cases.

Ogden proceeds to set out arguments in favour of his opinion that sickle-cell anæmia occurs only in Negroes or in people with Negro ancestry. He states that only eight cases of the disease in white people have been recorded. In one of these (Ogden's own case) a Negro ancestry was proven. Two of the other patients were American, and the remainder were all of southern European origin. It is often difficult to prove the absence of a negroid strain from any family. In people from the Mediterranean littoral opportunities for the admixture of Negro blood have been ample. "Hannibal's invasion of Spain and Italy (218 B.C.), the Moorish occupation of southern Spain (711 A.D. to 1442 A.D.), slave trade with Africa, participation of Negroes in European wars and other historic circumstances brought the Negro race into close contact with the white." Ogden states that in no recorded case of sickle-cell anæmia in a white person has the admixture of Negro blood been disproved. A "simple dominant non-sex-linked mendelian character may be transmitted to the bearer's descendants for over four centuries"; therefore his Spanish patient could have inherited the disease from a Moorish forebear.

Sicklæmia is of importance in the United States of America from the point of view of national health; for in that country there are over twelve million Negroes. Ogden suggests also that investigation of the sicklæmic trait might be of importance in the determination of paternity in certain doubtful cases.

Through the centuries black men from Africa have been transported to almost every corner of the earth. The population of every country must contain a sprinkling of people with a Negro ancestry. It is fair to assume that some 7% of such people have the sicklæmic trait and are therefore likely subjects of a severe hæmolytic anæmia. Anæmia in dark-skinned persons, especially if it is accompanied by jaundice, arthralgia and abdominal pain, should arouse suspicion of sickle-cell anæmia and should demand the examination of a wet blood film. A diagnosis of sicklæmia should not be discarded until a wet film has been examined after forty-eight hours.

[1] *Archives of Internal Medicine*, February, 1943.

Abstracts from Medical Literature.

RADIOLOGY.

Pleural Effusion and Ascites with Fibroma of the Ovary.

MAX RITVO (*American Journal of Roentgenology*, August, 1942) states that Meig's syndrome is the occurrence of pleural effusion and ascites in association with fibroma of the ovary. The syndrome is of particular interest to the radiologist because the condition may easily be diagnosed as cancer with metastatic involvement, and a hopeless prognosis given. The reasons for the formation of the fluid are not understood. The fluid is a transudate with a specific gravity of about 1·015. Changes in the circulation, probably due to back pressure, appear to be the most logical explanation at present, although the mechanism of the syndrome must await further study. The fluid recurs promptly after tapping and medical treatment is without effect. Operative removal of the pelvic mass effects a complete and permanent cure, and the fluid does not recur after operation. Radiation therapy is not indicated.

Chronic Subperiosteal Abscess.

JAMES F. BRAILSFORD (*British Journal of Radiology*, November, 1942) states that chronic periosteal abscess is less common than chronic central bone abscess, and that it forms a fairly well-defined group which possesses somewhat misleading clinical signs but characteristic radiographic and histological features. The outstanding clinical features are bouts of pain in the affected extremity; these vary considerably in severity. In some cases little more than discomfort is present, in others pain is sufficient to cause the patient to cease activity and to clench his teeth. A bout may be brought about by jarring the affected extremity. This, however, may exhibit no other signs of inflammation—no localized heat, redness or swelling. There may be no elevation of the temperature. If the affected area of the bone is relatively superficial, swelling may be noted, but the skin over the area will not show any change from the normal, the subcutaneous tissues will not be increased, and no undue tenderness may be recorded. These symptoms develop insidiously, and may persist for several years before the part is submitted to radiographic examination. The radiographic appearances suggest that there is a lesion of bones which commences as a localized focus of irritation beneath the periosteum—notably in the long bones. From this focus, for a distance of two or more inches up and down the shafts of long bones, a periosteal reaction occurs. During the first two months this will be recognized on the radiographs from a linear accretion of new periosteal bone which is thickest at the site of the focus. The new bone for a time is less dense than the normal cortex which it covers, but gradually the latter appears to be absorbed into the new tissue. Before it is completely absorbed the medullary outline of the original cortex, thin as a fine pencil line, can be detected by its slightly greater density, except at the focus where it is totally absorbed. Gradually during the next three or four months, this periosteal new bone acquires density and receives accretions, until the affected bone shows a dense, spindle-shaped expansion, which merges imperceptibly into the normal shaft above and below, that is, there is no line of demarcation between normal and abnormal bone, though the extent of the lesion can be roughly estimated from the thickness of the cortex. At this stage all signs of the original cortex of that area covered by this periosteal new bone will have disappeared. In the case of the long slender bones, like the ulna and radius, the periosteal reaction will extend completely round the shaft of the involved segment so that the spindle-shaped expansion is seen on all projections. At the site of the original focus a small, well-defined rounded area of radiotranslucency will be seen. It is situated beneath the thickest part of the cortex, and on a plane with the original periosteum. It persists throughout the development of the lesion, though in some cases it may be obscured by the density of the new bone. The radiographic appearances are such as one would expect to find as the result of a localized chronic subperiosteal focus of infection from which toxins are produced and diffused throughout the immediate neighbourhood.

The Respiratory Function of the Digestive Tract as the Basis of Röntgenographic Life Test.

J. C. DILLON (*American Journal of Roentgenology*, November, 1942) states that it has not yet been possible to establish exactly a correlation between the degree of expansion of the lungs and that of the air-filling of the stomach and the intestines; but it can be supposed that the more air there is in the stomach, the less the lungs expand. In any case, the finding of air in the stomach of the newborn after the first extrauterine breath is so absolute, and at the same time radiologically so well established, that radiography must be acknowledged to be the most reliable means of determining whether an infant was born alive or was stillborn. It must also be counted as the most sensitive means of finding air in the stomach. The author's investigations show that a quantity of air (0·2 square centimetre) which cannot be ascertained by the so-called hydrostatic gastric test can be easily detected by radiography.

Duodenal Ulcer Syndrome Caused by Ankylostomiasis.

H. A. YENIKOMSHIAN AND WILLIAM H. SHEHADI (*American Journal of Roentgenology*, January, 1943) state that gastro-intestinal disturbances caused by hookworm disease may produce symptoms closely simulating duodenal ulcer. Estimation of free gastric acidity reveals a rise to a level higher than that obtained in duodenal ulcer. In spite of varying degrees of severe anæmia, such a high gastric acidity is maintained. Radiographic studies in these cases show evidence of swelling of the duodenal mucosa, inconstant deformity of the duodenal bulb (duodenitis without ulcer niche), hyperperistalsis of stomach and duodenum, and commonly, reversed peristalsis of the duodenum without obstruction. Administration of a vermifuge results in the elimination of epigastric pain within twenty-four hours, and in the restoration of the duodenal wall in from eleven to twenty-four days.

Anatomical and Pathological Factors in Chest Radiography.

PETER KERLEY (*Radiography—Journal of the Society of Radiographers*, February, 1943) states that the ideal chest radiograph should show (*a*) the complete bony cage, (*b*) the chief subdivisions of the pulmonary arteries clearly defined, that of the lower lobe of the left lung behind the heart shadow being of particular importance, (*c*) the heart shadow with absolutely sharp borders, (*d*) the tracheal shadow, and (*e*) the left subclavian vein or the inferior *vena cava*. These two vessels can normally be visualized in the narrow and average chest in deep inspiration, but they are usually impossible to demonstrate in the obese. The subclavian vein runs over the top of the apex of the left lung, where it is seen as a soft semicircular opacity with a concave lower border. Its density is slightly less than that of an early tuberculous focus. The inferior *vena cava* is seen as a triangular opacity in the right cardiophrenic angle.

Hypersensitivity to Iodized Preparations in Excretion Urography.

IN an editorial (*American Journal of Roentgenology*, December, 1942), E. P. Pendergrass and associates at the Hospital of the University of Pennsylvania discuss an investigation they have made into the frequency and cause of death in fatalities occurring after excretion urography, a diagnostic procedure generally considered harmless. They elicited the fact that 24 deaths had occurred in a total of 661,700 examinations. The deaths were of two types—namely, immediate death due to hypersensitivity or idiosyncrasy to the drug injected or to colloidal shock, and delayed death, which occasionally occurred, presumably owing to preexisting renal damage. Those patients who died immediately upon the injection of the urographic medium showed certain similarities, in that death was apparently due to asphyxia as a result of laryngeal spasm and cardio-vascular collapse with gradually diminishing respirations, and pulmonary œdema was a prominent autopsy finding in some of the cases reported. Certain patients exhibited an extreme hypersensitivity to the injected substances, the hypersensitivity simulating anaphylactic shock. As a result of the various manifestations which these patients exhibit in reactions to excretion urographic media, the authors discuss at length the use of contrast media in asthma and other allergic disorders, before nephrectomy when the remaining kidney is diseased, for patients with severe jaundice, in repeated urographic examinations, in hyperthyreoidism, in pulmonary tuberculosis and in hypertension. As measures in the prevention of anaphylactic reactions, the authors recommend epinephrine solution (1:1,000) in a dose of from 0·3 to 0·5

cubic centimetre as a prophylactic measure immediately before injection of the contrast medium is begun. This precautionary measure should be carried out in the case of all patients who give a history of allergy; the use of pitressin to eliminate intestinal gas is strongly deprecated. Various preliminary tests have been suggested to determine the sensitivity of the patient to the contrast media used in urography. Both the cutaneous and ocular tests are quite easily carried out, and in the light of the tragic occurrences which have followed the use of excretion urographic media, it is imperative that one of these tests be employed prior to the intravenous injection of the medium.

Diseases of the Mediastinum and Associated Conditions.

LESTER W. PAUL (*Radiology*, January, 1943) states that hyperplastic tuberculosis is characterized by a tendency to cause well-defined enlargement of the mediastinal lymph nodes with or without associated parenchymal lesions, by involvement of the mediastinal nodes with little or no enlargement of peripheral nodes, by a relatively benign clinical course with few symptoms referable to the chest, and by a tendency towards gradual slow resolution. When peripheral nodes are available for biopsy, the lesions are found to be of the hyperplastic type and caseation is notably absent. This type of tuberculosis is more common in young and middle-aged adults, and there may be an associated *erythema nodosum*. Examination of the sputum and gastric contents for tubercle bacilli usually gives negative results, and tuberculin anergy is the rule. The process may be confined to the lymph nodes, or variable degrees of parenchymal involvement may be present. When the mediastinal and pulmonary lesions are extensive, fever, dyspnœa, cough and loss of weight may occur. While the process in the chest is essentially hyperplastic, it may progress into caseous tuberculosis, or caseous lesions may be found in other systems, such as the bones or genito-urinary tract. The degree of enlargement of the nodes is variable, but considerable. The hilum and paratracheal groups are chiefly affected. Bilateral changes are the rule, although the enlargement is practically always asymmetrical. The enlarged nodes produce a dense hilar shadow, the outer borders of which are "fuzzy", but distinctly nodular. The right paratracheal group is often more prominent than the left, and the outer border tends to be sharper, although seldom so distinct as in lymphoblastoma. Soft striations may be seen radiating outward from the hila into the mid-lung fields or toward the bases. When there is associated parenchymal disease, the pulmonary lesions may vary considerably in appearance, often being widely distributed, coarsely nodular or granular, and occasionally of stringy, fibrous character. Calcification may be present in the hilar areas; when found, it is believed to antedate the present illness. Differentiation from lymphoblastoma, especially Hodgkin's disease, may be difficult, although in many instances it can be made. In untreated Hodgkin's disease the shadows are sharper and the borders more clean cut; peripheral nodes are more frequently involved; the symptoms are in proportion to the degree of node involvement. Correlation with the clinical picture is important. X-ray therapy in small doses may be tried for help in the differential diagnosis; hyperplastic tuberculosis gives a slower response to such treatment. If available, a lymph node should be removed for microscopic examination. This disease in its pulmonary manifestations has been described in the literature under many names, such as hæmatogenous non-miliary tuberculosis, benign lymphogranuloma, tuberculous lymphoma, non-caseating tuberculosis, pseudo-tuberculosis, Boeck's sarcoid or pulmonary sarcoidosis, and mediastinal glandular tuberculosis. In a number of instances enlargement of the mediastinal lymph nodes has been found in supposedly healthy persons who showed no signs or symptoms. Follow-up studies in these cases have shown the same tendency to a benign course with gradual resolution over a period of months or years, no significant symptoms being noted at any time. Diagnosis in these cases can only be presumptive at first, and only by repeated observations can one with certainty rule out Hodgkin's disease. If the peripheral lymph nodes do not become enlarged, and they usually do not, proof may be entirely lacking, since the patient may recover completely. The degree of involvement may be surprisingly large, although symptoms are completely absent. While pathological proof of the correctness of the diagnosis may be impossible to obtain, the course of the disease and the radiographic appearance have led to the belief that the lesion is hyperplastic tuberculosis. If tuberculin anergy is present, this finding is of no significance in the differential diagnosis. Coccidioidomycosis can be ruled out by skin testing with coccidioidin.

PHYSICAL THERAPY.

The Therapeutic Use of Röntgen Treatment in Chronic Asthma.

W. M. HULL, R. M. BALYEAT AND L. K. CHOUT (*American Journal of Roentgenology*, February, 1943) present the results of treatment in a series of 100 consecutive patients suffering from chronic asthma treated by radiation therapy. They regard as important routine radiographic examination of the chest and nasal sinuses of all asthmatic patients, and whenever the sinuses are found involved they should be treated by irradiation. The leucocyte count is considered significant in evaluating the presence of infection in asthmatic subjects. The technique used is described. It consists of "cross-fire" irradiation applied to six distinct fields over the chest. It is thought that results are better when larger areas of lung are irradiated. Two fields are irradiated at the same sitting, and the usual dose is 100 *r* to each field, so that the total dose each day is 200 *r*. For the average subject a total dosage of between 800 *r* and 1,600 *r* is given through the six fields. The series of cases have been followed over a period of eighteen months, and during the first year from one to three courses of radiation therapy have been given. In 39% of the cases the result has been excellent; the patient has been completely relieved and has had no recurrence of attacks during the eighteen months. In another 40% good results followed treatment. Fair results were obtained in 13% and poor results or no benefit in 8%. There were no complications of the treatment other than nausea, and this was never severe. A routine procedure to combat this was to give hypodermically 5,000 units of vitamin B_1 per day.

Pathological Aspects of the Radio-Sensitivity of Tumours.

S. WARREN (*American Journal of Roentgenology*, September, 1942) points out that there are still many unanswered problems in the study of radio-sensitivity. It is not known why the group of tumours classified under the term lymphoma melt away with light irradiation, but the patient usually dies of the disease, nor why the great majority of malignant melanomata fail to respond to irradiation, and yet in a rare case cure will be effected by its use. The questions of radio-sensitivity and radio-resistance can as yet be answered only empirically. The author classifies tumours into three arbitrary groups. Those tumours which respond noticeably to a dose that does not ordinarily produce appreciable normal tissue damage (the equivalent of 2,500 *r* or less delivered to the skin in divided doses at 200 kilovolts) are classified as radio-sensitive. Those which respond to doses in the range 2,500 *r* to 5,000 *r* (producing a definite reaction in normal tissues) are classed as radio-responsive. Those tumours which require doses above 5,000 *r* are classed as radio-resistant. Unfortunately, radio-sensitivity and "radio-curability" are not synonymous. In general, the less differentiated the cell, the greater its sensitivity; but exceptions are numerous. From the clinical standpoint, tumour cells cannot be considered apart from the supporting stroma. Further, the tumour cell varies in its sensitivity as the cycle of cellular activity progresses. The fundamental reactions of cells to irradiation are essentially similar, varying in degree rather than in character. Evidence points strongly to the amount of irradiation absorbed as the essential factor in the response of the tumour cell, and other factors such as wave length are of minor importance. When one studies the cells of a tumour treated with X rays generated at voltages varying from 120 to 1,000 kilovolts, with γ rays of radium, or with β rays from radio-active phosphorus, one is impressed by the essential similarity of changes produced by these different agents. The production of a severe irradiation reaction is often necessary to bring about tumour regression, and this should be recognized as legitimate in the effective eradication of some tumours. When a tumour has once regressed, and then later recurs, it usually fails to respond appreciably to the dose of irradiation which caused its initial regression. By some, this acquisition of radio-resistance is ascribed to the failure of the already altered stroma to respond adequately a second time, and by others, to an actual selection of radio-resistant tumour cells, the sensitive cells being killed off and the resistant ones alone being allowed to develop.

Medical Societies.

MELBOURNE PÆDIATRIC SOCIETY.

A MEETING of the Melbourne Pædiatric Society was held on March 10, 1943, at the Children's Hospital, Carlton, DR. WILFRED FORSTER, the President, in the chair. Part of this report appeared in the issue of June 19, 1943.

Subdural Hæmatoma Simulating Hydrocephalus.

DR. H. J. SINN showed a male child, aged five months. The breech presentation of a large baby in a primiparous woman had occasioned the obstetrician much trouble, and though instruments were not used, a considerable amount of trauma was sustained by the after-coming head, and from the beginning fears were entertained for the patient's life. These fears were accentuated when the child began to have cyanotic "turns" and seemed rigid on bathing. A sharp pyrexial attack began on the second day and lasted for three days. The child was restless, but this condition had been controlled by sedatives. Dr. Sinn saw the baby first on its twelfth day. The colour was slightly dusky, but he was immediately struck by the appearance of the head; it was very large, measuring sixteen and a quarter inches in its maximum circumference, and was heavy and retracted. The brows were over-hanging, the fontanelle was enlarged and tense, the sutures were widely separated; the back was arched, the body approaching the opisthotonous position. The child's weight was nine pounds four ounces. On these findings a diagnosis of traumatic hydrocephalus was confidently made and an unfavourable prognosis was given. One week later, at the age of two and a half weeks, the child's condition was much worse. The colour was poor, and vomiting had set in and was persistent. The stools were frequent and green in colour, the temperature was elevated and the baby presented a dehydrated, wasted appearance. His weight was eight pounds four ounces. In this state he was admitted to the Children's Hospital. Thanks to the efforts of the staff, he made a remarkable recovery. The original diagnosis of hydrocephalus was confirmed, and as it was thought that no good purpose could be served by further treatment in hospital, the child was discharged.

The baby was next seen two weeks later, at the age of four and a half weeks. Vomiting was intermittent, and there had been several cyanotic turns, and one turn resembling a convulsive seizure and lasting about ten minutes. On examination, the child presented much the same appearance as at previous examinations. The circumference of the head was now seventeen and one-eighth inches, nearly an inch increase on the measurement three weeks previously. There seemed no reason to doubt the diagnosis of hydrocephalus. Twelve days later, at the age of six weeks, the child's head had grown nearly another inch and measured eighteen inches. At this stage the aid of the neuro-surgeon was enlisted. His investigations were enlightening. Lumbar puncture revealed a sluggish flow of obviously xanthochromic fluid. The Wassermann test failed to produce a reaction from the fluid, and blood cells were present in large numbers. This examination was followed by an attempt at ventricular puncture through the lateral angles of the anterior fontanelle. When the needle was inserted a few millimetres, large quantities of evenly blood-stained fluid were obtained from both sides. Attempts made to explore the ventricles were unsuccessful. From this time onward the child's condition considerably improved. The dusky turns became less frequent, vomiting ceased entirely, the child was quiet and placid, and three weeks after the operation, at the age of nine weeks, the head circumference was unchanged at eighteen inches, though the fontanelle was still large and tense.

At the age of ten weeks, further operation was performed. On lumbar puncture clear fluid was obtained, though microscopically it was found to contain numerous erythrocytes. The removal of 55 cubic centimetres resulted in considerable reduction in tension, and even in recession of the anterior fontanelle. An exploring needle was inserted through the lateral angles of the anterior fontanelle. At a depth of less than one centimetre, 20 cubic centimetres of blood-stained fluid were obtained on the right side and 60 cubic centimetres of similar fluid on the left side. X-ray examination later revealed a considerable quantity of air in the subdural space and some air in the ventricles, which were within normal limits in size. At the age of three months the operation was repeated and 15 cubic centimetres of yellowish fluid were obtained through the right angle of the anterior fontanelle; no fluid was obtained on the left side. Meanwhile, the patient had gained weight, weighing fourteen pounds at three and a half months, and the head was seventeen and a half inches in circumference—a reduction of half an inch. Progress since then had been uneventful. At the age of five months the baby weighed fifteen pounds four ounces, and the head circumference was eighteen and a quarter inches.

Dr. Sinn said it was axiomatic that one should never make a diagnosis with a hopeless prognosis until one had excluded all conditions that were amenable to treatment. He regretted that he had fallen into this error, and presented the case that others might not do the same. He was glad to see Dr. F. P. Morgan in the audience, and he was anxious to hear the views of Dr. H. Boyd Graham, who had presented a similar case to the society about two years previously, and also those of Dr. Kate Campbell.

DR. F. P. MORGAN said that there was little he could add to Dr. Sinn's remarks. The nature of the malady was disclosed by tapping through the lateral angles of the anterior fontanelle. In this case blood was obtained at a depth of a few millimetres. Hydrocephalus was not present. Some of the remarkable successes obtained in cases of so-called hydrocephalus might well have been in cases of this nature. The differential diagnosis was not easy. Occasional rises of temperature might suggest aseptic fever from hæmorrhage, but this was not reliable in small infants, whose temperature fluctuated for minor reasons.

DR. KATE CAMPBELL thought the case was instructive. Supratentorial lesions gave a better prognosis than lesions below the tentorium. The symptoms and signs in this case were not on all fours with hydrocephalus. In that condition, a quiet progressive increase in the size of the head was noticed, and head retraction and cyanotic "turns" were not usual. Dr. Campbell recalled a case in which intraventricular hæmorrhage occurred. She said that Dr. Sinn's case was an unusual one in her experience.

DR. H. BOYD GRAHAM thought the hæmorrhage must have been slow not to produce signs of pressure on the motor area. The patient he had shown to the society some years before was a baby, aged two days, with hemiplegia on one side. Dr. Littlejohn had snipped out an egg-shaped flap of overlying tissue with scissors, and ladled out blood clot from the subdural space with a spoon. The baby made a satisfactory recovery, but unfortunately later became spastic on the other side. Dr. Graham had perused the literature on the subject, and formed the opinion that the condition was not so rare as one was led to believe.

DR. ROBERT SOUTHBY asked Dr. Sinn whether he thought a subdural hæmorrhage of the size described was compatible with life. He suspected that hydrocephalus might have existed previously and played some part in the difficult delivery and in the intracranial hæmorrhage. Dr. Southby asked Dr. Morgan if there was justification for exploration of the intracranial contents when lumbar puncture produced negative results and other signs pointed to a possible intracranial hæmorrhage.

DR. W. W. MCLAREN said that the case demonstrated the advisability of lumbar puncture when trauma occurred to the head at birth. Every effort should be made to give such babies a chance. Vitamin *K* was also of help.

DR. WILFRED FORSTER said that he saw a number of these babies. They were bad feeders and were subject to attacks of cyanosis. The great difficulty was to localize the hæmorrhage. He asked Dr. Morgan to elaborate his methods of investigation.

DR. ERIC PRICE asked Dr. Morgan whether an ordinary needle would be satisfactory to explore the cerebrum.

Dr. Sinn, in reply, said that he was delighted that the case had provoked so much interest and discussion. He thanked all the speakers for their remarks and was particularly grateful for the help of Dr. Morgan with his wide knowledge of intracranial work. Dr. Sinn was surprised that Dr. Campbell with her vast experience of newborn babies could recall only one similar case, and even the case quoted was scarcely on a par with the one under discussion, as the hæmorrhage in the former case was intracerebral. The results of Dr. Boyd Graham's study of the literature were not in accord with Dr. Campbell's experiences with the frequency of the malady. In reply to Dr. Southby, Dr. Sinn said that he thought that the hæmorrhage was compatible with life, as the present case demonstrated. Dr. Southby's suggestion of a preexisting congenital hydrocephalus was an apt one, as the baby's head measured sixteen and a quarter inches on the twelfth day, nearly three inches greater than normal. But this was counterbalanced by the inability of Dr. Morgan to explore the ventricles.

Such an operation would be simple if hydrocephalus existed. The other question Dr. Sinn preferred to leave in the able hands of Dr. Morgan.

Dr. Morgan said that he was quite sure that hydrocephalus did not coexist in this case. In reply to Dr. Forster, he said that he did not think he could answer satisfactorily the question of localization of the lesions in children. It was elementary, but none the less true, that the most important aid was a detailed history and clinical examination, preferably on repeated occasions. Exploration with the brain needle was like a sixth finger to the neuro-surgeon. It was invaluable in cases of a grave nature. The injection of air or of "Thorotrast" into the brain was a hazardous procedure; but encephalography and ventriculography were helpful in some cases. The good diagnostician used a combination of all these methods. Dr. Morgan did not think the ordinary needle was satisfactory for exploration of the brain. In reply to Dr. Southby, Dr. Morgan said that he thought there was justification for exploration of the intracranial contents when the signs pointed to intracranial hæmorrhage, though lumbar puncture produced negative results. Dr. Morgan pointed out that evidence of blood in the subdural space might easily be overlooked if reliance was placed on lumbar puncture alone.

A MEETING of the Melbourne Pædiatric Society was held at the Children's Hospital, Carlton, on Wednesday, April 14, 1943, DR. WILFRED FORSTER, the President, in the chair.

Pemphigus.

DR. JOHN KELLY discussed pemphigus. He said that the term pemphigus was derived from a Greek word meaning blister or bleb; it might, therefore, be used to cover all bullous diseases, but in actual fact it was used to denote a chronic and usually fatal disease characterized by the appearance of bullæ upon apparently normal skin. It had to be distinguished from other bullous lesions, such as bullous syphilide, bullous impetigo, *dermatitis herpetiformis* and *epidermolysis bullosa*. In the last-mentioned, blisters appeared near bony prominences after trauma and were often hæmorrhagic. In *dermatitis herpetiformis* the lesions tended to be grouped and to arise on a previously red area, the vesicles were generally small in diameter, and irritation was severe. Bullous impetigo occurred fairly frequently in newborn infants and usually responded to simple treatment. Organisms, usually streptococci, could be grown on culture from the blebs. Other stigmata of congenital syphilis usually accompanied bullous syphilide.

Dr. Kelly went on to say that in true pemphigus, the blisters were of considerable size; they occurred on any part of the body's surface or mucous membrane and apparently arose on normal skin. If the top of the observer's finger was pressed on the skin of a patient with well-developed pemphigus, the horny layer of the epidermis would be felt to slide on the underlying layer and might even be pushed off. This was known as Nikolski's sign; it was not pathognomonic, and occurred in *epidermolysis bullosa* and the bullous form of *erythema multiforme*.

Dr. Kelly recalled a family of two children, both of whom had died of pemphigus, one at the age of seventeen days, the other at the age of fourteen days. Attempts at culture from the vesicular fluid produced no growth of organisms, and at autopsy no abnormality was discovered. Dr. Kelly presented a photograph to show the great denudation of the body surface that might accompany pemphigus.

Dr. Kelly then showed two children from another family who were suffering from the disease. There was no family history of the disease, and no consanguinity. The eldest member of the family had died of pemphigus in 1938; the Wassermann test had failed to produce a reaction in that case, and the autopsy was not informative. The first child shown was aged two years and five months. Since birth large blisters had developed on any part of the body surface. These had caused no great disability. No lesions had occurred in the mouth, but corneal ulceration had developed. At the time of the meeting there was a large tense bulla on the left hand. The second child shown was aged twelve months, and since the second day of his life he had exhibited true bullous lesions. Dr. Kelly also invited the members to study the associated peculiar dystrophy of the nails.

DR. ROBERT SOUTHBY asked whether there was an infective basis to the condition and also whether there was any question of deficiency disease, especially of vitamins or calcium or iron.

Dr. Kelly, in reply, said his patients with pemphigus were exhibited to show that true pemphigus occurred in small infants. The condition of the children had improved somewhat with increase in the vitamin intake. No investigation had been made to determine the possibility of calcium or iron lack, but the children drank ample quantities of milk and their bony development was good.

Deforming Lesions of the Face.

Large Pigmented Facial Mole.

Dr. Kelly's third patient was a baby, aged seven and a half months, who had a huge pigmented mole covering most of the right cheek. Some areas within the lesions were more deeply pigmented than the rest. No physical therapy could achieve much in this case, which required excision and skin grafting. Dr. Kelly was anxious to hear what other members thought about the optimum age at which this operation should be undertaken and what form of skin grafting should be used.

Large Ulcerating Hæmangioma of Face.

Dr. Kelly's last patient was a baby, in whose case rapid growth of what appeared to be a simple angioma took place between the ages of two and three months. The lesion became raised, caused the eye on that side to close and began to ulcerate. In Dr. Kelly's opinion this case furnished a good reason why angiomata should be dealt with whilst the baby was quite young, between the third and fourth weeks of life. A lesion such as the one under discussion was slow to heal, and it healed leaving an atrophic papery scar. There nearly always remained, as in the baby shown, a residual rim of angiomatous tissue, with which it was difficult to deal. The case raised the questions (i) whether radium or radon should be used to treat the borders, and (ii) how much later plastic surgery should be undertaken.

Comment.

MAJOR D. O. BROWN thought that both patients presenting deforming lesions of the face should be treated by skin grafting. Major procedures, however, were not practicable for small children, and it was better to wait. The pigmented mole would present little difficulty as the child grew older. The other lesion, however, did not offer such good chances of success. It should be left for some years. The best results would be obtained with an abdominal flap, a dermatome graft or a straight Wolfe graft.

COLONEL GLOVER agreed with the views of Major Brown. The main question was at what time to carry out the plastic treatment. It was preferable to wait until the child was two to four years old; at that age such procedures were easily tolerated. The pigmented mole was easily dealt with. It should be replaced by a free graft. Probably some further "touching up" would be required. The vascular nævus would respond to irradiation somewhat, but might break down easily and become secondarily infected. The nævus might increase in size, and that might hasten the need for interference. Colonel Glover said that it would be possible to excise at one operation most of the nævus except that on the lip. It should be replaced by a free graft, the lip and edge being left for subsequent treatment. The free graft might not be permanently satisfactory, but it would enable one to eliminate the vascular tumour and hinder recurrence and make the subsequent course much easier. The pedicle flap was probably more desirable for older children.

Dr. Kelly thought the baby with the pigmented mole would probably develop hair on the lesion. The parents would be likely to grow anxious for something to be done, and no doubt would find someone to use X rays or radon. Then the damage would be done, and the work of the plastic surgeon rendered more difficult. Dr. Kelly thanked the speakers for their helpful expressions of opinion.

Œsophageal Pouch.

DR. MONA BLANCH showed a child, aged two years, who had been taken to another hospital six weeks previously with the following history. Twelve months earlier she had developed bronchitis. When this cleared she began to vomit small quantities of food and mucus after one or more meals each day. Gradually the amount vomited increased, and vomiting occurred after each mouthful of solid food. Fluids, including milk, were well tolerated, and her comparatively good general condition was ascribed by her mother to this fact. Seven to ten days before she was admitted to hospital she contracted a "cold". Her cough was most troublesome at night, and the vomiting became worse; she even vomited water. Her appetite was normally large, and she was always

hungry. She sometimes made a catching noise in her throat. She was admitted to hospital and treated for several days with "M & B 693" in an effort to overcome the respiratory infection. The vomiting ceased, and her condition improved rapidly. But when the solid diet was resumed, vomiting recurred; usually small amounts were vomited at intervals during and after feeds. A barium bolus examination was carried out and reported on by Dr. G. Villiers in the following terms:

> There is a pouch-like swelling anterior to the œsophagus and behind the *manubrium sterni*. A large opening existed at the upper end, and a finer opening appeared to connect the bottom of the pouch with the œsophagus.

The child was transferred to the Children's Hospital, where a further series of films were taken and the following report was made by Dr. Colin Macdonald:

> An abnormality (apparently congenital) exists in the mid-œsophagus behind the *manubrium sterni*. Here the œsophagus is bifurcated. The anterior half of the bifurcation shows at times a pouch-like dilatation. The bifurcations (including the pouch) show peristalsis resulting in the pouch being able to contract and empty. Below the bifurcation is an œsophageal narrowing, which is (in part at least) spastic. This narrowing shows a partial obstruction to even the thin barium emulsion. The lower third of the œsophagus is normal, and there is no thoracic stomach or diaphragmatic hernia. In the posterior of the two mid-œsophageal channels there appears to be a radiolucent linear foreign body about one inch long.

An œsophagoscopic examination made by Dr. Raymond Hennessy revealed a reddened and swollen œsophageal lining; the condition precluded a thorough examination of the pouch. A stricture existed below this, and between the two a foreign body was present. This was grasped in the forceps, but unfortunately it slipped out and was not recovered, even though an intensive search was made. The child was radiologically examined again four days after the œsophagoscopic examination. Dr. Macdonald reported that "the linear radiolucency" (presumably a foreign body, for example, a match) was still present in the posterior channel. However, it was not so clearly defined as in the films taken before the œsophagoscopic examination.

DR. GWEN VILLIERS said that some years ago she had shown at a meeting of the society a child with multiple œsophageal strictures. At that time she had consulted the literature on œsophageal abnormalities, and though her memory was hazy, she recalled a description of an anterior diverticulum. It was thought to be remnant of a visceral pouch; this apparently was uncommon anteriorly, usually lying between the posterior constrictors of the pharynx. She was not clear whether Dr. Macdonald could demonstrate a dual passage of barium in the œsophagus in this case. At the fluoroscopic examination the diverticulum behaved as a pouch that was filled up and emptied by the œsophagus. Dysphagia was present, and no spasm was noticeable at the time. As for the demonstration of the foreign body, Dr. Villiers could only bow her head in shame; but her report was not preceded by the œsophagoscopic examination.

DR. H. C. COLVILLE said that he could not express an opinion as to the nature of the malady. The narrowing of the œsophagus was a predominant feature of the case. The child was suffering from the effects of obstruction, the pouch proximal to the obstruction being thrown in, as it were, as a pathological curiosity. Gastrostomy was advisable as a preliminary measure. This would allow maintenance of nutrition, and at the same time rest the œsophagus. In his experience, a large inflammatory element accompanied such lesions occurring at either end of the alimentary canal, and whilst the œsophagus was functioning for the passage of food, no major surgical procedure should be contemplated. Sir Hugh Devine had pointed out this important principle and acted on it with success. After gastrostomy, further investigation and treatment would be possible. The routine treatment for œsophageal stricture should be instituted—passage of a thread and retrograde dilatation. The problem of the œsophageal diverticulum could be left till later, and might resolve itself.

DR. H. D. STEPHENS said that he had discussed the case with Dr. Hennessy. The narrowing seen in the X-ray film was apparently not organic, as the œsophagoscope could be, and was, passed through the site of the constriction as far as the stomach in the search for the foreign body. The diverticulum could not be explored because of inflammation.

DR. ROBERT SOUTHBY said that he remembered a smaller baby he had shown three years earlier, who presented similar features. He wondered whether the condition was an aftermath of a swallowed foreign body lodging in the œsophagus twelve months previously. In the case he had presented, vomiting, loss of weight and respiratory infection suggested a difficult feeding problem, and the foreign body was discovered accidentally when the chest was examined by fluoroscopy. A similar history was obtainable in Dr. Blanch's case; it should raise suspicions that a foreign body might be present.

Dr. Blanch, in reply to Dr. Villiers, said that Dr. Macdonald did not suggest a double œsophagus at the fluoroscopic examination. The films, however, gave the impression of a septum between two channels. In fairness to Dr. Villiers, Dr. Blanch said that Dr Macdonald's report was made after the œsophagoscopist had demonstrated the presence of the foreign body. The original idea was, as Dr. Colville had suggested, a two-stage operation preceded by gastrostomy. Dr. Blanch did not know that Dr. Hennessy had passed the œsophagoscope through the site of the constriction. Dr. Southby's case was interesting and there was a strong case for the theory of the foreign body as the primary agent, as he had suggested. Dr. Blanch was able to find very little in the literature on the subject. The only thing approaching the condition was a double œsophagus. At the moment, the condition was still *sub judice*. The œsophagoscopic examination would be repeated when the œsophagitis had subsided.

Cystic Swelling in Neck.

DR. ERIC PRICE showed a male child, aged fourteen months, who had been quite well till three weeks earlier, when a swelling suddenly appeared in the neck whilst he was being bathed. Inspiratory stridor was noticed shortly after the child's birth, but had disappeared after a few weeks. It had reappeared with the swelling and was audible now. The swelling was behind the sterno-mastoid muscle; it was bluish in colour, indefinite in outline, freely fluctuant and quite compressible. Two weeks earlier it had been aspirated in another city, and pure blood was obtained. Every effort to palpate the tumour under anæsthesia caused stoppage of respiration. However, one could feel a gap in the deep fascia through which it appeared to protrude. The tumour seemed to be entirely fluid and varied in size with respiratory movements. There was no gross pharyngeal abnormality. Dr. Price was anxious for guidance in the management of the patient. The sensitivity to handling indicated that excision would be a difficult matter. He thought the tumour was a venous mass communicating with the internal jugular vein. He recalled a similar case some years ago, in which at operation a dilated mass of veins was found communicating with the external jugular vein.

DR. BRUCE HALLOWS expressed himself as entirely in agreement with Dr. Price that the tumour was a venous aneurysm of the distal end of the internal jugular vein. There appeared to be a valve in the internal jugular vein, situated close to its junction with the innominate vein, and if by any chance during severe muscular exercise the valve became weakened or ruptured, a pulsatile swelling might result. If so, the ligation would have to be made quite close to the union of the internal jugular and the innominate veins.

DR. WILFRED FORSTER thought the diagnosis was between three conditions—cystic hygroma, varix and branchial cyst. The swelling enlarged when the child cried, and so was probably connected with the vascular system. Dr. Forster said that when he was very young and inexperienced he had been confronted with a similar case. Treatment with quinine and urethane was the vogue at the time. He made an injection into the mass, which became dark, thickened to a large hard lump, and ultimately disappeared. With his present knowledge, Dr. Forster was not prepared to carry out such a procedure. It was probably best to make an exploration, and if a deep connexion was found, to tie it off. Dr. Stephens had given the advice that one should load the point of the scapel with streptococci.

DR. H. D. STEPHENS said that Dr. Forster's last remark brought him to his feet. He regarded the swelling as a cystic hygroma, and considered that the pulsatile effects were attributable to its connexion with the carotid and jugular sheaths. He had seen such a sudden increase in size as had occurred in this case, and had ascribed it to a sudden hæmorrhage. However, the swelling appeared to be a single large cyst, and not loculated as a hygroma usually was. Dr. Stephens thought that it should be explored, but he did not think the whole mass would be removable. In the old days superimposed infection seemed to help recovery; hence Dr. Forster's parting shot.

Dr. Price, in reply, thanked those who had contributed to the discussion. As the suggestions became gloomier and gloomier he had been waiting for Dr. Webster to apply the *coup de grâce*. No explanation had been forthcoming for the stridor; it might signify interference with the laryngeal nerve. Dr. Price promised to attempt to remove the mass.

The Treatment of Burns.

MAJOR BLANDFORD (United States Army Medical Corps) outlined briefly the method in use at an American general hospital in Australia and in the United States for the treatment of burns. He said that the tannic acid and silver nitrate method was favoured. Tannic acid jelly was satisfactory for minor burns. More severe burns required admission of the patient to hospital. The severity of a burn depended on the age and size of the patient. In any individual case, it depended on the area involved, and the depth of the burn. The blood concentration rose rapidly and had to be watched. No grease should be used in the immediate treatment of burns. Morphine was the best sedative. Warmth was provided by blankets, and the patient was transported to hospital as soon as possible. In the United States a "burn team" operated, using mobile equipment. Asepsis was essential; bedding, instruments and clothing must be sterile. Blebs were opened and debris was removed. Grease was removed by a satisfactory solvent. Tannic acid was then applied with a spray and dried with an electric lamp to hasten coagulation. Then a 10% solution of silver nitrate was applied. For anæsthesia, the choice lay between ether given *per rectum*, barbiturates given intravenously, and a large dose of morphine. Nitrous oxide was not satisfactory, but could be used. The patient was kept in a sterile bed, and spraying with tannic acid was continued until a satisfactory coagulum had formed. If blebs appeared at the margin of the tan, these were opened and then tanned. The blood concentration was constantly watched by the aid of red blood cell counts and hæmatocrit readings. One aimed at keeping the number of red cells below 6,000,000 per cubic millimetre. One hundred cubic centimetres of plasma were given for each point by which the hæmatocrit reading was over the normal figure of 45. A careful check was made on the fluid intake and output. The coagulum was left until the œdema had subsided. After the œdema had subsided, the coagulum wrinkled and felt loose. If it was felt that pus lay underneath, as much of the coagulum as possible was removed, and compresses of boric acid were applied to loosen the remainder of the coagulum still further. The wound was then prepared for skin grafting by being washed in Dakin's solution. The limbs were splinted to prevent contractures, and healing at the flexures was hastened. Various methods of grafting were sometimes required. They included the Thiersch, the razor and the dermatome grafts and the pedicle flap. The pinch graft was not advised. Major Blandford then showed a film to illustrate the treatment of burns by skin grafting.

DR. W. FORSTER expressed the thanks of the society to Major Blandford for his interesting talk, and threw the subject open for discussion.

DR. BRUCE HALLOWS asked what was the army procedure for the treatment of burns in the field where only limited first-aid treatment was available.

Major Blandford replied that there was no established procedure. Kits were often equipped with tannic acid and tannic acid jelly, and these could be used. Aeroplane transport made possible quick transport to hospital where better facilities were available. Sulphonamide drugs were usually available for use as well. One aimed at producing a coagulum of powder and serum.

DR. H. D. STEPHENS asked whether Major Blandford had used heterologous grafts with success. Often such a large area of skin required grafting that great difficulty was experienced in obtaining sufficient skin from the patient. This was especially so in the cases of children. Dr. Stephens had used large areas of skin from a donor of an appropriate blood group, but had found that the graft broke down on the fourteenth day. Dr. Stephens also asked whether the granulation tissue was always removed in preparation for a skin graft. In some cases, if this was done, a large depression resulted, and when the graft was put in place, it lay below the surface. Dr. Stephens finally asked whether there was any objection to overlapping of the grafts, and what solution was used on the skin and the dermatome before the graft was taken.

Major Blandford replied that heterologous grafts were not usually successful in his experience. It was always advisable to remove all the granulation tissue to enable the graft to obtain the better blood supply from the underlying tissues. It was unwise to split the granulation tissue—in other words, to leave some *in situ*. The blood supply to granulation tissue was poor. Depression at the site could be avoided by the use of a greater thickness of graft. A small amount of overlapping of the grafts made very little difference, and it was scarcely avoidable in view of the irregular edge of the razor graft. The dermatome graft was a blessing in this respect. Rubber cement made in the United States was the preparation used on the skin and dermatome before the graft was taken.

DR. ROBERT SOUTHBY asked what was the procedure when an extensive burn had been tanned, and sepsis was present underneath.

Major Blandford replied that the floating tan should be cut off; that was usually a painless procedure. The wound was then washed in Dakin's solution, which should be fresh and at the proper pH. Compresses were applied and changed each day. The moist dressing soaked off the remaining eschar. Then a "Vaseline" gauze dressing was applied or skin grafting was carried out, whichever was required.

MAJOR D. O. BROWN said that one of his last conscious acts before joining the armed forces was to review the results of the treatment of burns at the Children's Hospital. A major fact established was that the coagulation method had reduced the mortality rate from 14% to 4%, and this without the use of serum, plasma or the intravenous administration of saline solution. Coagulation methods alone had brought this result about. In spite of this, Major Brown had become afraid of tannic acid in the treatment of war burns. The eyelids and hands were commonly involved, and such burns were made worse by tanning. He was averse to any form of coagulation on these two sites. This was just his personal opinion, and he had no desire to introduce a contentious subject. The modern use of transfusions of plasma apparently saved patients previously saved by other methods. If this was so, there seemed little use for tannic acid at all. Awful trouble was experienced with third degree burns in the Middle East. The problem of removing an adherent tan was sometimes very difficult; in some cases no effect was observed after three months. Major Brown disagreed with the use of tannic acid in forward areas. If used, its application should be a major surgical procedure carried out under operating theatre conditions. He preferred a greasy preparation and the use of sulphanilamide. But the major decision had to be made there and then, as once greasy applications were used tanning became impracticable. As for grafting, he agreed with the method so well illustrated in the film shown. The treatment of burnt hands had been one of the major advancements of the decade. The dermatome graft was the best. Webbing of the finger, whether congenital or acquired, required individual or separate operative procedures. It was difficult to obtain an efficient hand if both sides were treated at the same time.

Major Blandford replied that Major Brown had had experience of the treatment of burns in forward areas; this had not yet come within his own scope. In the cases demonstrated on the films the webs were short, but were relaxing sufficiently, and he thought that no subsequent trouble would result.

Wilms's Embryoma.

DR. REGINALD WEBSTER said that within recent weeks, and since the last occasion on which he had brought some pathological specimens to the notice of the society, he had received three examples of the tumour which might be said to hold a monopoly in the field of malignant renal neoplasms in childhood. The tumour in question, which had been variously described as *carcinoma sarcomatodes*, renal sarcoma of infancy, adenosarcoma and rhabdomyosarcoma, was now universally recognized as a blastocytoma and generally known as Wilms's embryoma. To support the three most recently acquired specimens he had brought along some others from the museum, which illustrated well the macroscopic features of the tumours and the distribution of their metastases.

The first of the three to which Dr. Webster directed attention had been removed by Dr. J. G. Whitaker from a boy, aged two years. The first impression was that the operative trophy was a polycystic kidney. Examination revealed, however, near the upper pole and in the neighbourhood of the remnant of renal tissue in this situation, intracystic papillary growth, which in microscopic sections showed the histological appearances of a malignant embryoma. Dr. Webster still regarded this specimen as a polycystic kidney, in which the malignant neoplasm had arisen in the persisting remnant of renal tissue. He could not believe that the wide open spaces, the limiting walls of

which exhibited such strength and stability, had resulted from necrotic changes or cystic degeneration in the tumour.

The second tumour had formerly belonged to an infant, aged eighteen months, who was deprived of it by Dr. Eric Price. It was a typical example and showed much interstitial hæmorrhage.

The third specimen, removed a week earlier by Dr. B. R. Hallows from an infant, aged twenty months, was uniformly pallid, and although rather exceptional in this respect was otherwise typical.

Dr. Webster went on to say that the majority of these renal blastocytomata occurred in infancy or before the end of the second year. He thought he was correct in saying that their only clinical manifestation was the swelling, and although, as these specimens showed, they frequently displayed much hæmorrhage within their substance, such an event as hæmaturia as a guide to their early discovery was a rare occurrence. They formed large, rounded tumours which apparently grew from the renal pelvis, for the cortex of the kidney was often spread out over them in a thin layer. Unless they were exceptionally large they offered no great difficulty in removal, but always came out cleanly, and thereby encouraged hopes of eradication which were never realized.

The microscopic structure was characteristic. The main mass of the tumour was composed of small rounded or oval cells of a distinctly sarcomatous type, lying in a loose œdematous or mucoid connective tissue matrix. Intimately mingled with these cells were tubules lined by columnar cells, and these epithelial elements might be present in great numbers. They seemed to represent an attempt at the formation of renal tubules, and imperfect glomeruli also might sometimes be recognized. More rarely, islands of cartilage and smooth and striated muscle fibres might be distinguished. The microscopic section from the third specimen Dr. Webster had shown was notable for the excessively numerous tubules lined with epithelium and the presence of smooth muscle tissue.

With regard to the origin of this type of blastocytoma, Dr. Webster said that the most commonly accepted theory was that of Wilms. The complicated structure of the growth indicated that its source must be sought far back in the developmental history of the patient, and Wilms traced it to a mesoblastic rest. The myotome, or primitive segment of the body, gave rise to the kidney *Anlage* and also to the different connective tissues of the body wall, striated muscle, bone and cartilage, and it was supposed that cells of the myotome, displaced and arrested in their growth, might later be the starting point of the tumours in question.

An interesting feature of the dissemination of the embryonal and mixed tumours of the kidney in childhood was that they frequently invaded and grew along main veins—an actual extension of tumour tissue into and along the lumen of the vein, or thrombus of newgrowth so to speak, as opposed to neoplastic emboli. In his book, "The Spread of Tumours in the Human Body", Dr. R. A. Willis gave chapter and verse regarding a number of authentic instances of invasion of the *vena cava* and extension up this vessel to the heart. H. R. Dew, one of their own school and now Professor of Clinical Surgery at the University of Sydney, had described a complex Wilms's tumour of the kidney which grew down the spermatic vein to the testis. In addition to spread by invasion and growth along main veins, renal embryomata of childhood metastasized principally in lungs, liver and lymph glands, and not commonly in other tissues.

Post-Graduate Work.

LECTURES IN SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine announces that the lectures to be given by the medical officers of the United States Navy on Monday, July 5, 1943, at the Stawell Hall, 145, Macquarie Street, Sydney, at 4.30 p.m. are as follows:

"Psychiatric First Aid", by Mark Gerstle, Junior Lieutenant Commander (M.C.), V.(S.), U.S.N.R.

"The Treatment of Pilonidal Cysts", by Richard Dwight, Lieutenant Commander (M.C.), V.(S.), U.S.N.R.

"Some Legal Aspects of Venereal Disease Control", by F. O. Graeber, Lieutenant (M.C.), U.S.N.R.

"Massive Sulphathiazole Therapy in Acute Gonorrhœal Urethritis", by Eugene A. Hand, Lieutenant (M.C.), U.S.N.R.

There will be no charge for attendance at these lectures, which are open to all members of the medical profession. Medical officers of the Australian and Allied Forces are also invited to be present.

National Emergency Measures.

THE SALE OF MOTOR-CAR TIRES: A WARNING.

THE following letter addressed from the Controller of Rubber to the Medical Secretary of the Victorian Branch of the British Medical Association is published for the information of general practitioners.

[COPY.]

COMMONWEALTH OF AUSTRALIA.

Department of Supply and Shipping.

1st June, 1943.

Dr. C. H. Dickson,
Medical Secretary,
British Medical Association,
East Melbourne.

Dear Sir,

Investigations carried out recently by this Department with a view to checking on the operations of the less reputable tire dealers who are selling both new and used tires on the black market, have revealed certain possible sources of supply.

One will be of interest to your members, some of whom, obviously unwittingly, have been responsible for a number of new tires being supplied to these dealers. An illustration of one means by which these people secure tires is given hereunder.

A member of the medical profession who, probably, is particularly busy at the present time found that the tires fitted to his car were in such a condition that their continued use was unsafe. He called at his local tire dealer and explained to the proprietor that he was anxious to secure two new tires. The proprietor, knowing that the doctor is on a particularly high priority, was very pleased to assist him.

The doctor, as so often happens, hadn't the time to concern himself with the details of documents which he had to sign when applying for equipment, scanned the details quickly and placed his signature on the form, at the suggestion of the dealer leaving the insertion of the particulars to him.

The dealer, knowing that the doctor required two tires, placed an order for four, and the tires eventually were supplied, two of which were fitted to the doctor's car, and the others sold to a private car operator who was prepared to offer a fantastic price.

This Department has means of checking all these applications, but is most anxious to avoid making individual checks, as such action will only mean that the doctor will be subjected to undesirable questioning, and furthermore, his valuable time will be wasted.

We have approached you, as the Secretary of the British Medical Association (Victorian Branch), with a request that you be good enough somehow to let your members know of this rather serious state of affairs so that they may give us their co-operation by examining most carefully the details of any application for any controlled goods which they may require in connection with their profession.

You will appreciate that we acknowledge the importance of the medical practitioner in the scheme of things today, and have allotted him a particularly high priority so that he may not be subjected to any hindrance or inconvenience in securing his essential requirements.

Yours faithfully,

P. H. ELVINS,
for Controller of Rubber.

Correspondence.

PROPORTIONAL REPRESENTATION.

SIR: Dr. C. C. McKellar's reference to proportional representation illustrates our delay in changing our outlook. About eighty years ago, no less a man than John Stuart Mill published a work entitled "Representative Government" pointing out the justice of proportional representation.

Some years ago I managed to get the system used for election to the Council of the Victorian Branch of the British Medical Association. In my absence abroad it was reversed to the present system of striking names out of a list, a system which, according to my mathematical friends, gives all sorts of results. The reason was that in a small meeting, say of forty members who were to elect ten representatives, four first votes would have their choice. (Why not?) All this could be avoided by adopting the system of the Royal College of Surgeons and voting by post.

In politics the Australian system of electing the Senate is regarded as the worst in the world.

But as twenty-two nations, and many organizations, have adopted proportional representation, feeling about it just as Dr. McKellar does, we can copy Galileo and say *"e pur si muove"*.

It is, however, remarkable that Great Britain, who has led so many great changes, still adheres to an obsolete and unjust system, though many of its leaders are urging change, and she has adopted it for India and other parts of the Empire.

Yours, etc.,

103-105, Collins Street, Melbourne,
June 2, 1943.

JAMES W. BARRETT.

OMISSIONS FROM TEXT-BOOKS.

SIR: Dr. Haire appears to have been most unfortunate with his clinical cases upon whom the self-control theory of birth control has been tried. I have just been reading a booklet by a "naturotherapist", brought to my notice by a patient of his, who has tried out this method over two years of her married life and is most enthusiastic about it. She has strong conscientious objections to any other method (based upon Genesis, chapter 38). The "naturotherapist" claims most successful results with his cases, even with the three-day method, let alone the longer term. The self-control method, even if not 100% successful, could, at least, be used to reduce the incidence of pregnancy and limit a family to some extent. Cowards and weaklings could combine chemical contraceptives with it. The rubber abominations and that hideous degradation of modern civilization, the birth-control clinic, could be scrapped. Well-meaning young couples should not be driven to perdition with these things, but should be given the option, at least, of less evil methods. After all, their ancestors got on pretty well without any of these things and the population was always on the increase. The pandering of the profession to selfishness, cowardice, degeneracy and vice has gone much too far in recent years, and is much worse overseas than in this country.

A well-known archæologist recently expressed the view that some civilizations that have been as low as the animals have been permitted to continue, but that a "civilization" lower than the animals and cursed with any kind of abomination upon the large scale is destroyed by a series of national disasters even before it exterminates itself. The maternal sacrifice, heroism and devotion shown by the animal creation upon an almost universal scale is in strange contrast to the behaviour of the human race in modern degraded civilizations of the twentieth century—notable chiefly for contraceptives, abortions and national extermination. It is perfectly reasonable to suppose that the friction of these hideous rubber abominations upon the cervix will cause many cases of cancer when this thing has had long enough to take effect. It is merely common sense. The chemical contraceptives are probably the cause of a good deal of mild pelvic inflammation and troublesome discharges. The good old-fashioned method of a morphia injection during the dilatation stage of labour and forceps for delivery (and general anæsthesia for tears, if any) was much fairer to the child than all this unnecessary doping of the mother. Many victims of unnecessary inductions (for being overdue) have a much worse labour than they would if left to start off themselves, and more than one course of Watson's treatment (or at most two courses) is unfair to the child.

I would remind Dr. Haire that moral bias is not the only kind of bias exhibited in these days.

Yours, etc.,

35, Normanby Street,
Middle Brighton, S.5,
Victoria.
June 7, 1943.

JESSIE B. SIMPSON.

SIR: Dr. Norman Haire's report (THE MEDICAL JOURNAL OF AUSTRALIA, June 5, 1943) that he has seen several hundred pregnancies result from intercourse limited so as to exclude the dangerous phase from the ninth to the seventeenth day is undoubtedly correct. The ninth to the seventeenth day is unsafe only for women who menstruate regularly every twenty-seven days.

In the case of the 26-day cycle the dangerous phase is from the eighth to the fifteenth day.

In the 28-day cycle it is from the tenth to the seventeenth and so on when it becomes from the fourteenth to the twenty-first day in a 32-day cycle.

In other words it varies for each individual who must have her own particular rhythm worked out for her. If this is done and the periods are reasonably regular, there is a vast amount of evidence to prove that this method is both scientific and safe.

But the doctor must study the matter accurately before advising the patient.

J. V. Schwind, M.D., in an article in *Northwest Medicine* of July, 1942, sums up the matter as follows:

> Prevention of pregnancy by other than contraceptive methods is a matter deserving of more attention than most physicians give it. One finds that many patients who, because of religious taboos or for other reasons, have asked doctors about the natural or "rhythm" method of birth control, have been told that it is not sufficiently reliable to be depended upon.
>
> This is definitely not true in the majority of cases, and usually such an answer by the physician is due to the fact that he has not acquainted himself with the fundamental principles of the rhythmicity of fertility, or else he does not care to take the time to explain the method to the patient.

As, apart from any moral aspect, an increasing number of patients is asking about this procedure, every medical practitioner should familiarize himself with the method.

Yours, etc.,

544, Brunswick Street,
North Fitzroy, N.7,
Victoria.
June 12, 1943.

ALLAN C. KEANE.

[This correspondence is now closed.—EDITOR.]

AN UNUSUAL INJURY TO THE RECTUM.

SIR: Of course, we have have all read with interest Dr. Pye's letter headed "An Unusual Injury to the Rectum" which appeared in the journal of June 5.

It would be interesting to know if the fluid extracted from the abdominal cavity was examined and reported upon.

Yours, etc.,

LEONARD AVERY, D.S.O.
(R.A.M.C.T.).

66, King Street,
Sydney,
June 16, 1943.

The Royal Australasian College of Physicians.

EXAMINATION FOR MEMBERSHIP.

PROVIDED a sufficient number of candidates is offering and if circumstances permit, an examination for membership of the Royal Australasian College of Physicians will be held at Sydney in August and September, 1943.

The examination will consist of: (i) A paper on the principles and practice of medicine, including pathology, therapeutics and the history of medicine. (ii) An oral examination, which may include the clinical examination of patients, together with the identification of naked-eye and microscopic specimens.

The written paper will be taken in capital cities where candidates are offering on Saturday, August 28, and the corresponding clinical examination will be conducted at Sydney on Thursday, September 23.

Application forms may be obtained from the office of the College, 145, Macquarie Street, Sydney, and should be in the hands of the Acting Honorary Secretary at this address not later than Saturday, July 31.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 125 and 130, of June 10 and 17, 1943.

ROYAL AUSTRALIAN AIR FORCE.

Citizen Air Force: Medical Branch.

The probationary appointments of the following Flight Lieutenants are confirmed: K. Johns (265175), B. Jarvis (267090).

Flight Lieutenant W. D. Cunningham (261896) is granted the acting rank of Squadron Leader whilst occupying a Squadron Leader post with effect from 20th April, 1943.

The following Flight Lieutenants are transferred from the Reserve with effect from the dates indicated: R. A. Hill (257085), A. C. Schweiger (257345), W. W. Rail (255174), N. J. Chamberlain (256869), J. D. Connellan (256866), R. J. Fleming (257137), J. R. Watt (257402), R. E. Wood (256797), 26th April, 1943; G. Sutherland (256391), 27th April, 1943.

The following is appointed to a commission on probation with the rank of Flight Lieutenant with effect from the date indicated: Joseph Francis Ziegler, M.B., B.S., F.R.C.S., F.R.A.C.S. (257480), 26th April, 1943.

The following Flight Lieutenants are transferred from the Reserve for full-time duties with effect from the dates indicated: F. P. Ch. De Crespigny (255171), 20th April, 1943; A. P. Roberts (266395), 3rd May, 1943; C. S. Harper (297386), 6th May, 1943; I. H. Spark (267437), 10th May, 1943; C. K. Hemmingway (266936), 17th May, 1943.

John Bertram Gilchrist Gibson, M.B., B.S., M.Sc. (277428), is appointed to a commission on probation with the rank of Flight Lieutenant (Temporary Squadron Leader) for part-time consultant duties with effect from 1st May, 1943.

The appointment of Flight Lieutenant J. W. Reid (251613) is terminated with effect from 19th May, 1943, on medical grounds.

The appointment of Flight Lieutenant W. R. Chalk (276699) is terminated with effect from 19th May, 1943.

Reserve: Medical Branch.

John Irving Guenther, M.B., B.S. (287414) is appointed to a commission on probation with the rank of Flight Lieutenant with effect from 10th May, 1943.—(Ex. Min. No. 168—Approved 15th June, 1943.)

CASUALTIES.

ACCORDING to the casualty list received on June 15, 1943, Major C. E. Thelander, A.A.M.C., Brisbane, is reported to be missing, believed drowned as a result of enemy action.

According to the casualty list received on June 21, 1943, the undermentioned are reported to be missing, believed drowned: Captain L. L. Bedkober, A.A.M.C., Forbes; Major G. G. Cooley, A.A.M.C., Edgecliff; Captain S. D. Foley, A.A.M.C., Darlinghurst; Captain B. F. Hindmarsh, A.A.M.C., Macksville; Major L. Holland, A.A.M.C., North Sydney; Captain R. C. Johnston, A.A.M.C., Mosman, North Queensland; Major G. R. Jones, A.A.M.C., South Grafton; Major I. H. Sender, A.A.M.C., Armidale.

Obituary.

DAVID HANNAM GRAHAM.

WE regret to announce the death of Dr. David Hannam Graham, which occurred on June 16, 1943, at Killara, New South Wales.

ARTHUR RATTEN.

WE regret to announce the death of Dr. Arthur Ratten, which occurred on June 19, 1943, at Essendon, Victoria.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Moffitt, Adrian Grenfell, M.B., 1940 (Univ. Sydney), 12th Australian Army Field Regiment, A.I.F., Australia.

Channon, James Edward Grey, M.B., B.S., 1940 (Univ. Sydney), 1, Locksley Street, Killara.

Diary for the Month.

JULY 1.—South Australian Branch, B.M.A.: Council.
JULY 2.—Queensland Branch, B.M.A.: Branch.
JULY 6.—New South Wales Branch, B.M.A.: Council Quarterly.
JULY 7.—Victorian Branch, B.M.A.: Branch.
JULY 7.—Western Australian Branch, B.M.A.: Council.
JULY 9.—Queensland Branch, B.M.A.: Council.
JULY 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JULY 13.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JULY 13.—Tasmanian Branch, B.M.A.: Branch.
JULY 20.—New South Wales Branch, B.M.A.: Ethics Committee.
JULY 21.—Western Australian Branch, B.M.A.: Branch.
JULY 22.—New South Wales Branch, B.M.A.: Clinical Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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